

NOISE ELEMENT

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N ELEMENT OF THE GENERAL PLAN
CITY OF ESCONDIDO

APRIL 1979

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N O I S E E L E M E N T

AN ELEMENT OF THE GENERAL PLAN

CITY OF ESCONDIDO

APRIL 1979



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April 25, 1979

Honorable Mayor and Members of the
City Council
City of Escondido, California

SUBJECT: Adoption of the Noise Element of the Escondido
General Plan

Council Members:

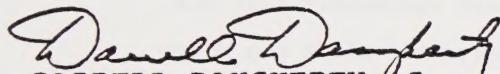
On March 27, 1979, the Planning Commission reviewed and considered the adoption of the Noise Element Draft as an added element to the General Plan mandatory by State Law.

The Commission recommended adoption of the Draft Element by a vote of 6 to 0 (Commissioner Short absent).

RECOMMENDATION:

That the City Council approve and adopt and Draft Noise Element of the Escondido General Plan.

Respectfully submitted,


DARRELL DAUGHERTY, Secretary
Escondido Planning Commission

attachments

cc City Clerk
City Attorney
file (2)

RESOLUTION NO. 3050

A RESOLUTION OF THE PLANNING COMMISSION
OF THE CITY OF ESCONDIDO, CALIFORNIA,
RECOMMENDING APPROVAL OF THE NOISE ELEMENT
OF THE GENERAL PLAN.

APPLICANT: THE CITY OF ESCONDIDO

CASE NO. : 79-19-GP

WHEREAS, the Planning Commission did hold one public hearing
to consider the Noise Element of the Escondido General Plan;

WHEREAS, State Law requires that the City adopt a Noise
Element as part of the General Plan;

WHEREAS, an Environmental Impact Report, PP 93, was prepared
under the provisions of the California Environmental Quality
Act of 1970 Guidelines, and in accordance with Article 1090 of the
Escondido Zoning Code; and

WHEREAS, notice of said hearing was duly published as
required by law, and a copy of said notice, together with an Affidavit
of Publication, has been filed in the records of the Planning
Commission of the City of Escondido; and

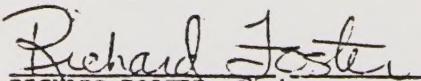
WHEREAS, the public hearing was held at the time and place
specified in said Notice on March 27, 1979; and

WHEREAS, no one spoke in favor and nobody spoke in direct
opposition; and

NOW, THEREFORE, BE IT RESOLVED that the Planning Commission
of the City of Escondido does hereby adopt, and recommends that the
City Council set for public hearing and subsequently adopt the Noise
Element of the General Plan, pursuant to Case No. 79-19-GP.

NOW, THEREFORE, BE IT FURTHER RESOLVED that the Planning
Commission of the City of Escondido does hereby PASS, ADOPT AND
APPROVE by a majority vote, at a regular meeting held on the 27th
day of March, 1979, the Noise Element of the General Plan, by the
following vote, to wit:

AYES:	COMMISSIONERS:	CATE, FOSTER, MITCHELL PFEILER, RONQUILLO, TUCKER
NOES:	COMMISSIONERS:	NONE
ABSENT:	COMMISSIONERS:	SHORT


RICHARD FOSTER, Chairman
Escondido Planning Commission

ATTEST:

Darrell Daugherty
DARRELL DAUGHERTY, Secretary
Escondido Planning Commission

I hereby certify that the foregoing resolution was passed
at the time and by the vote above stated.

Levi Minter
Clerk of the Planning Commission

RESOLUTION NO. 79-68

A RESOLUTION OF THE CITY COUNCIL OF THE
CITY OF ESCONDIDO, CALIFORNIA, ADOPTING
A NOISE ELEMENT OF THE ESCONDIDO GENERAL
PLAN

WHEREAS, the Planning Commission of the City of Escondido has, by Planning Commission Resolution No. 3050 approved a Noise Element of the General Plan after holding duly noticed public hearings thereon; and

WHEREAS, this City Council has held a public hearing after due and legal notice thereof as required by law; and

WHEREAS, this City Council is desirous at this time and deems it to be in the best public interest to so approve said Noise Element;

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Escondido, California, as follows:

1. That the above recitations are true and correct.
2. That, upon due consideration of all the evidence submitted, said Noise Element of the General Plan of the City of Escondido is hereby adopted.

PASSED, ADOPTED AND APPROVED by the City Council
of the City of Escondido, California at a regular meeting
thereof this 25th day of April, 1979.

AYES : Councilmen: Best, Harmon, Rady
NOES : Councilmen: Bittner, Danell
ABSENT : Councilmen: None

APPROVED:



DOUG BEST, Mayor of the
City of Escondido, California

ATTEST:

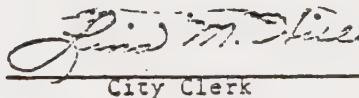

LINA M. HILL, City Clerk of the
City of Escondido, California

STATE OF CALIFORNIA)
COUNTY OF SAN DIEGO : ss
CITY OF ESCONDIDO)

I, LINA M. HILL, City Clerk of the City of Escondido,
California, hereby certify that I have compared the foregoing
copy with the original Resolution No. 79-68 passed and adopted
by said City Council at a regular meeting thereof, at the time
and by the vote therein stated, which original Resolution is
now on file in my office, and that the same is a full, true
and correct copy thereof and has not been amended or repealed.

Witness my hand and the seal of said City of
Escondido this 27th day of April, 1979.

(S E A L)



LINA M. HILL
City Clerk

INTRODUCTION

The Noise Element has been prepared as required by Section 65302 (g) of the State Government Code which requires all City and County General Plans to include a noise element, and follows closely the guidelines issued by the Office of Noise Control in February of 1976.

As with other elements of the General Plan, the adopted goals and policies of the City were also used as guidelines. Specifically, the most applicable adopted goal states:

Quality of Life

"Maintain and promote the environmental quality of the Escondido area by developing and enforcing adequate safeguards against all forms of pollution and by measures designed to preserve the natural setting and ecological balance of the area so vital to the fostering of the quality of life of which Escondido is so justly proud."

Certainly noise affects the quality of life, both the physical, the social, and the mental. Noise is defined as unwanted sound. Unwanted or excessive noise affects the enjoyment of recreational pursuits, interferes with work, play, study, and sleep. It affects health in terms of permanent hearing losses, and may be a factor in heart disease, ulcers and mental illness. Noise produces stress which affects individuals as well as influencing their social behavior. It adversely affects property values and productivity. Noise is an insidious pollutant; it cannot be seen, smelled, touched or (normally) felt. Although sound can be measured, many of its effects cannot.

As growth and urbanization increase and the products of technology proliferate, noise increases. Even when individual noise sources themselves remain at constant levels, adding more noise sources of the same level creates "louder noise", because noise is measured in terms of pressure, and pressures are cumulatively additive.

It is the intent of this element to identify and evaluate existing and potential future noise sources and to propose methods to either reduce noise, control it, or mitigate its effects. This information can then be used as one of the tools with which to make knowledgeable and reasonable land use decisions and to formulate ordinances and procedures to implement such decisions.

FINDINGS

When compared to some other cities and to the considerations required by the guidelines, Escondido does not now have a serious noise problem. There are no air facilities of any consequence within or near the planning area; the railroad facility runs just one train a day and limits its penetration of the planning area to the industrial area; there are no existing fixed rail transportation facilities nor any planned in the foreseeable future, and our industrial area is compact and consolidated with little interface with conflicting land uses.

The noise problems Escondido presently has are generally confined to vehicular traffic, construction activity, or nuisance categories (off-road vehicles, barking dogs, etc.).

Specifically, the findings of this report are as follows:

1. The State of California requires that local agencies include a noise element within their general plan.
2. The primary purpose of the legislation is to determine and mitigate noise levels associated with major transportation systems and other noise generators.
3. Noise (unwanted sounds) may adversely affect the health and well being of people.
4. Noise analysis is important in determining land use compatibility and land use distribution, especially near major transportation corridors.
5. There are no commercial aircraft facilities in the planning area; noise from aircraft is negligible and not expected to increase.
6. Noise from the railroad is very minimal, and should not increase. There are no present or planned fixed-rail transit systems serving Escondido.
7. The major source of noise pollution is motor vehicles, on freeways and major streets.
8. The largest source of complaints are motorcycles, power saws, and barking dogs in residential areas.
9. Existing local industries are not major sources of noise and are generally isolated from residential areas. However, the extremely high decibel levels permitted in the zoning ordinance may create the potential for disruption of residential areas by industrial noise.
10. The regulation of the noise levels of individual sources (especially transportation sources) has been largely pre-empted at the Federal and State levels. Local jurisdictions retain the power to regulate equipment operation and land uses to minimize noise impact, as well as enforcement of the State Motor Vehicle Code.

11. The City's current noise control ordinance was first adopted in 1949 and is in need of a comprehensive updating.
12. The State insulation code requires special noise analysis and mitigation for residential uses other than single family houses proposed for development in areas with average day and night sound levels (Ldn) in excess of 60 decibels measured on the A-weighted scale (expressed as 60dbA Ldn).* Such noise levels already extend up to 450 feet into residential districts.
13. Traffic noise projected for 1990 based on the circulation element traffic predictions, indicate significant increases in noise along all arterials, major roads, and collectors.
14. The provisions of the motor vehicle code for phased reduction of motor vehicle noise emmissions for auto have been amended to freeze the limit at 80 db (A) at 50 feet, rather than provide for lower noise emmission standards in the future.
15. As a noise descriptor, Ldn approximates the cumulative noise exposure of the community (CNEL)* to within one decibel, and has been chosen as the preferred noise descriptor for this study.

* See page 10 for a description of various methods of describing or measuring noise.

RECOMMENDATIONS

The recommendations contained herein are in the form of suggested policies and programs to implement the primary goal of providing an environment in which noise does not become detrimental to health, enjoyment of property, or a disturbance of lifestyles. Some require specific direction or action by the City Council for implementation, others merely indicate an intent to continue existing policies or programs.

1. It is recommended that noise control considerations be incorporated in the land use and transportation planning process.

Review the General Plan and the adopted elements evaluating land use compatibility, especially noise sensitive uses and residential uses in close proximity to freeways, arterial streets, and industrial areas.

Initiate a study of truck traffic to consider the establishment of specific truck routes if infringement into residential areas is determined.

Review new development plans and require noise-attenuating measures such as special building insulation, increased setbacks, screen walls, etc. whenever residential or noise-sensitive land uses are proposed in the noise impact area of a major transportation facility as indicated on the noise contour map. A noise impact area is defined as an area where noise exceeds 60 dbA.

Require a noise contour map for a proposed facility which would generate significant levels of noise as a condition for obtaining a building permit.

Designate special areas as quiet zones for certain noise-sensitive land uses such as hospitals, rest homes, and schools, and make noise standards there more restrictive than elsewhere.

2. It is recommended that noise generators be controlled through ordinance regulation (where not preempted by the Federal or State government).

Adopt a comprehensive noise control ordinance to prohibit excessive noise within the City boundaries and establish an active program for enforcement of this ordinance. Such a proposed ordinance is included in the appendix.

Provide training and direction to the Police Department to enforce existing California Motor Vehicle Code noise control provisions.

Require that notice be given to all prospective purchasers of new dwellings constructed in noise impact areas; as defined by the State Insulation Code (Title 25, Chapter 1, subchapter 1, Article 4).

Extend noise insulation standards to include single family residences.

Eliminate noise control performance standards from the zoning ordinance or amend them to conform to the proposed noise control ordinance.

3. It is recommended that the City set an example in noise reduction by requiring all City vehicles, facilities and equipment to meet or exceed strict noise standards.

Maintain and operate all City vehicles and machinery at levels which meet or exceed health and established state standards (Motor Vehicle Code, Section 27160).

In purchasing equipment, machinery, and vehicles all reasonable steps should be taken to purchase quiet, competitively priced units. Information on noise emmissions of most types of machinery and equipment is available from manufacturers. This type of information should be gathered and considered by the department purchasing the equipment, in conjunction with the City Purchaser, before the decision to purchase is made. No machinery to be operated outside of a noise suppressing enclosure should be purchased which would exceed standards for machinery, equipment, construction equipment, or vehicles, set forth in the proposed noise control ordinance. The Noise Control Officer shall provide technical assistance when necessary.

Promote increased public awareness concerning the health effects of noise and ways they can assist in reducing noise.

Participate and encourage inter-governmental coordination to abate noise.

RELATIONSHIP TO OTHER GENERAL PLAN ELEMENTS

The General Plan consists of a number of elements which, when taken together, provide a policy guide to direct the social, economic, and physical development needed to serve the City's residents and their activities for a period of 20 to 30 years. To some degree, all elements of the General Plan are related and interdependent. The Noise Element is closely related to a number of elements of the General Plan such as the Land Use, Circulation, Housing, and Open Space/Conservation elements.

The Land Use Element, which designates the proposed general distribution, location and intensity of land uses, should consider potential noise sources to achieve such goals as compatible land uses and quiet neighborhoods.

The circulation system is a physical determinant of land use in a community, and a major source of noise. The Circulation Element established the location and development standards for roadways, and projects future traffic demand based primarily on the Land Use Element. 1990 noise level projections for this element are based on the 1990 traffic projections from the Circulation Element. The growth rate projections upon which the Circulation Element is based may be high. Lower growth rates would reduce the projected increase in transportation-generated noise. The Circulation Element will continue to be reexamined to assess whether routes, speed, truck traffic and highway design could be modified to minimize the impact of transportation-related noise.

The Noise Element is closely related to the Open Space/Conservation Element, as noise can adversely affect the enjoyment of outdoor leisure time. Conversely, open space can be employed to buffer noise-sensitive land uses. Noise contours to 45db(a) in the vicinity of parks and outdoor recreation areas are shown elsewhere in this report.

RELATIONSHIP TO ADOPTED GENERAL PLAN GOALS AND
POLICIES AND OTHER ORDINANCES

The City Council and Citizen Advisory Committees have indicated their general intentions regarding noise and noise sources in several adopted goals and policies. Specifically, the General Plan contains the following basic goals:

Quality of Life

Maintain and promote the environmental quality of the Escondido area by developing and enforcing adequate safeguards against all forms of pollution and by measures designed to preserve the natural setting and ecological balance of the area so vital to the fostering of the quality of life of which Escondido is so justly proud.

Industrial Development

Adopt strict anti-pollution controls governing the type of industry permitted in this area and enforce such controls over all industrial operations to insure that a minimum of air, noise and water pollution result from such operation.

Traffic Circulation

Maintain and improve the City's network of streets so that major traffic carriers do not interfere with or destroy residential amenity.

CITY NOISE STANDARDS

Several issues must be considered in the development of noise standards. Most communities desire a quiet local environment, and Escondido's past character as an agricultural rural town has a strong influence in establishing these standards. Because there are only two freeways, no nearby airports, a relatively quiet industrial base and many areas in agricultural groves, the community noise pollution is not yet at an offensive level to most people. It would be desirable to establish community noise control standards to at least maintain existing levels. This will only be possible if a concerted effort to control and abate noise is undertaken. Adoption of community noise standards is the first step in that process.

The Department of Housing and Urban Development has published standards for noise exposure and building sound insulation as applicable to federally-assisted housing developments. The National Environmental Policy Act of 1969 (NEPA) and the California Environmental Quality Act of 1970 (CEQA) requires an environmental impact statement to include noise considerations. The County of San Diego, the City of San Diego, and the League of California Cities have adopted community noise standards that have an influence on the establishment of our standards.

The City noise standards are to be used to evaluate and control non-transportation related noise sources. In addition, the standards are to be used to evaluate the noise impact of future land use proposals. The community noise standard refers to the total amount of noise received by an individual from all sources of noise regardless of the distance, i.e., ambient noise levels. The most appropriate way to state such standards is in average decibel measurements in day, evening and nighttime periods,

The following table shows the recommended ambient noise levels for the various land use zones. These recommendations are also reflected in the proposed ordinance in Appendix "A".

LAND USE CATEGORY	ZONE	TIME	SOUND LEVEL (db(A))
Single Family Residential	R-A, R-E, R-1, R-T	7 a.m. to 7 p.m. 7 p.m. to 10 p.m. 10 p.m. to 7 a.m.	50 45 40
Duplex	R-2	7 a.m. to 7 p.m. 7 p.m. to 10 p.m. 10 p.m. to 7 a.m.	55 50 45
Multiple Family Residential	R-3, R-4	7 a.m. to 7 p.m. 7 p.m. to 10 p.m. 10 p.m. to 7 a.m.	60 55 50
Commercial	A11 Commercial	7 a.m. to 7 p.m. 7 p.m. to 10 p.m. 10 p.m. to 7 a.m.	60 55 55
Industrial	M-1, IP	7 a.m. to 10 p.m. 10 p.m. to 7 a.m.	65 60
	M-2	7 a.m. to 7 p.m. 7 p.m. to 7 a.m.	70 65

For the purpose of these standards and the proposed ordinance "ambient noise level" shall mean the higher of the following:

1. Actual measured ambient noise level, or
2. Presumed ambient noise level as determined from the chart above.

These noise limits are widely exceeded by transportation noise along the busiest segments of Escondido's circulation system, and should not be construed to restrict uses that do not cause traffic noise levels to be exceeded by more than one decibel (A); that is, where transportation noise levels exceed these limits, the transportation noise levels should be considered as the ambient noise levels.

The standards proposed in this element will require the adoption of a Noise Control Ordinance for the implementation and establishment of specific standards for particular circumstances. The ordinance also proposes allowances for higher sound levels for short periods of time and restrictions on specific noise sources such as construction and nuisance violations.

NOISE MEASUREMENT

Noise is the result of minute pressure variations caused by energy given off as a noisemaker comes in contact with the atmosphere. The loudness of noise is directly related to the energy released by the noisemaker. Human hearing is capable of distinguishing between extremely minute variations in sound pressure. Sound pressure of as little as .0002 of a microbar can be perceived(a microbar is 1 millionth of standard atmospheric pressure). Sound pressure levels of as high as 2000 microbars can also be distinguished. Thus the loudest noise we can hear has 10 billion times the energy of the quietest noise we can hear. This range is far too great for normal arithmetical expression; thus it has become customary to express noise magnitude in decibels. Decibels are logarithmic ratios which compare the sound pressure level of the noise of interest to a reference sound pressure level. The most common reference pressure is .0002 microbars, the quietest noise human hearing can percieve. The chart which follows illustrates the relationship between sound pressure levels in microbars and decibels.

Because decibels are logarithmic ratios and not linear units, they have certain properties which must be understood in order to compare dB levels. The following statements illustrate some basic properties of decibel manipulation.

1. The addition of two sound levels of equal strength results in an increase of 3db(A).

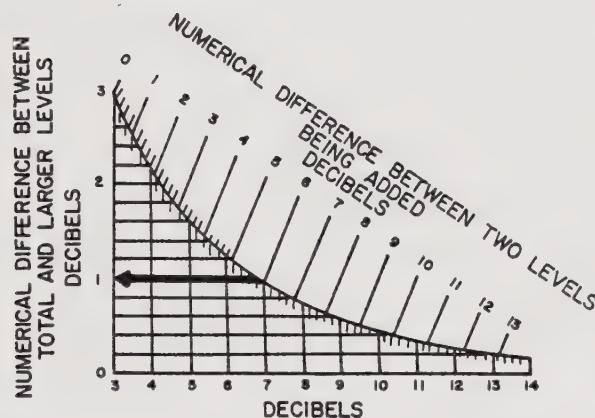
Example:

$$60 \text{ db(A)} + 60 \text{ db(A)} = 63 \text{ db(A)}$$

Addition of unequal decibel levels requires use of a decibel addition table, which yields an increment to be added to the highest level.

Example:

$$76 \text{ db(A)} + 70 \text{ db(A)} = 77 \text{ db(A)}$$



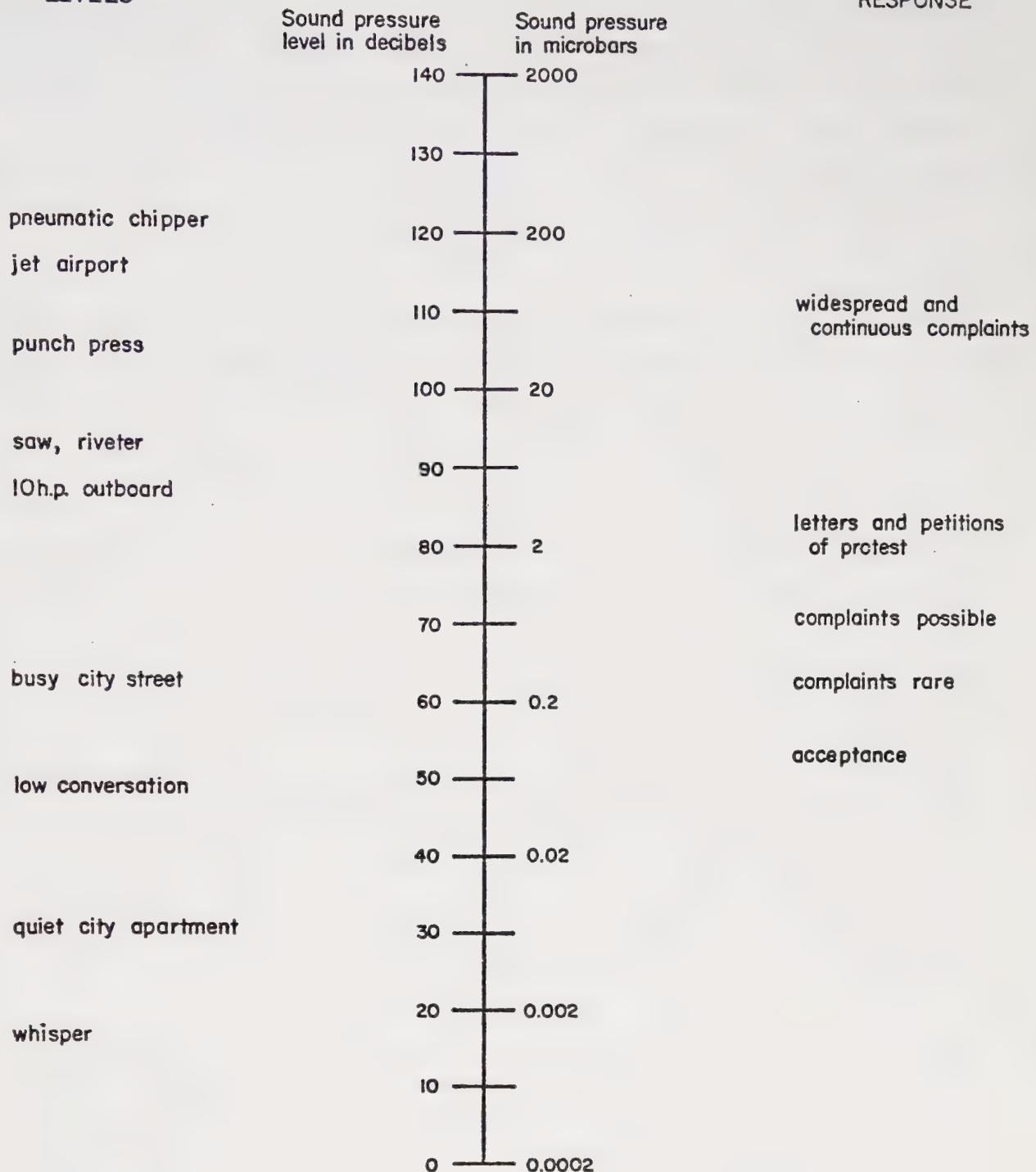
2. People do not perceive noise in direct proportion to the energy given off by the noisemaker. In general, a 10db(A) increase in sound pressure level is perceived as twice as loud by most people.
3. Doubling the distance from noise source to receptor generally reduces the noise level (sound pressure level) by 6 db(A).

There are a number of different scales used to measure noise. Each scale averages noise exposure by giving different weighting to different noise characteristics such as time of day, duration, or pitch. The following scales are commonly used as descriptors for noise exposures:

A-Weighted Sound Level, db(A) - The A-weighted sound level gives greater weight to the frequencies of sound to which the human ear is most sensitive, primarily the middle frequencies. Sound level measurements in db(A) are used in almost all measurement scales which are used to describe noise that affects people.

TYPICAL SOUND
LEVELS

TYPICAL COMMUNITY
RESPONSE



L_{10} Statistical A-Weighted Noise Level - The L_{10} level represents the A-weighted noise level which is exceeded 10 percent of the time for which the noise is measured. This measurement scale is commonly utilized for the assessment of traffic noise. It represents the louder sound levels occurring during the measurement period. This same scale can be used for other levels, such as L_{50} , which is the noise level which is exceeded 50 percent of the time, and so on. $L_{10} + 5$ dBA is approximately equal to L_{dn} .

Community Noise Equivalent Level, CNEL - CNEL is a measure of the cumulative noise exposure in the community, with greater weights applied to evening and nighttime periods. For CNEL calculations, day is defined as 7 a.m. to 7 p.m. with a weighting factor of unity. Evening is 7 p.m. to 10 p.m. with a weighting factor of 3. Night is defined as 10 p.m. to 7 a.m. with a weighting factor of 10. Noise occurrences at night are given greater weight because noise at that time is more disturbing. CNEL is the scale used to measure the noise levels of all commercial and general aviation airports in the San Diego Region.

Day-Night Average Sound Level, L_{dn} - The day-night level is essentially the same as CNEL with the exception that the evening time period has been dropped and all occurrences during this three hour period are grouped into the daytime period. Noise contours developed by CNEL and L_{dn} procedures will normally agree within one decibel, which is an indistinguishable difference. The L_{dn} technique represents the evolution of CNEL in that this method provides computational simplification of an established rating scale with no significant loss of accuracy. L_{dn} was chosen by CPO for use by its consultant, Wyle Laboratories, in preparing noise contours for freeways, highways, and railroads in the San Diego Region.

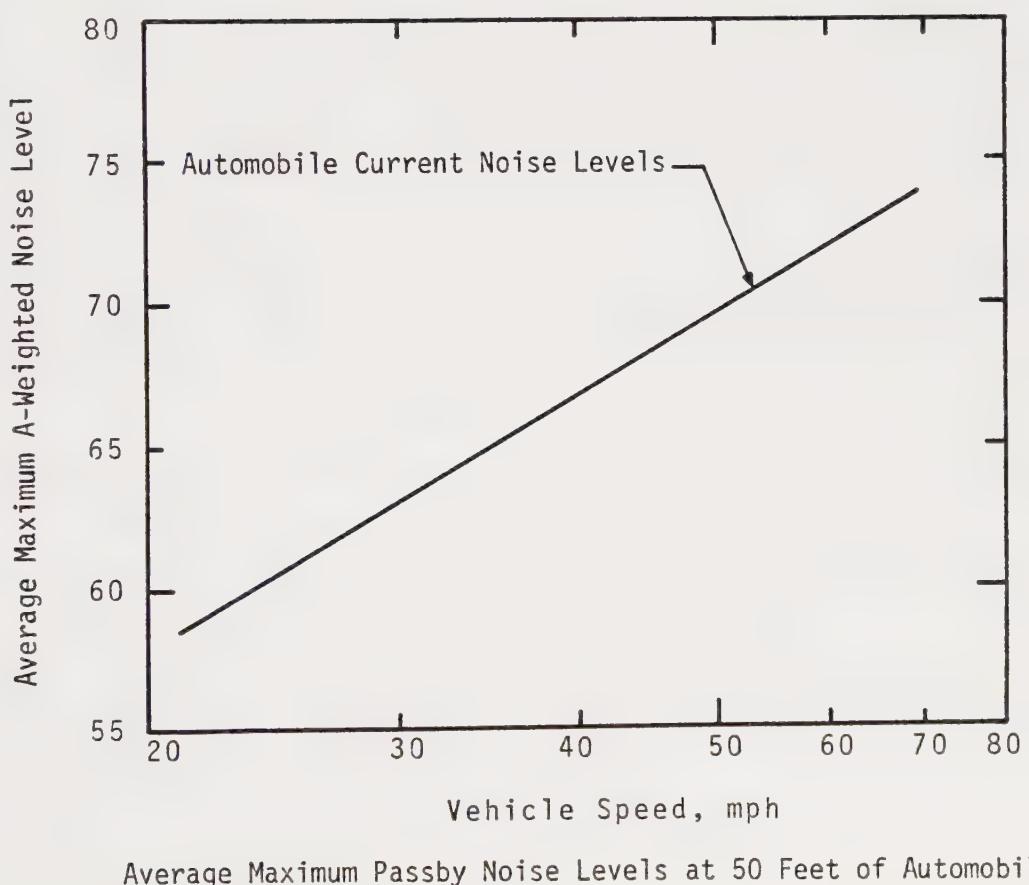
Other measurement scales have been used, especially for the description of airport noise. One is Noise Exposure Forecast (NEF). Another is Composite Noise Rating (CNR), which is the scale used in the noise contours which have been done for Miramar NAS. All four scales (CNEL, L_{dn} , NEF, and CNR) can be converted from one to another with reasonable accuracy for planning purposes. L_{dn} was chosen for use in this project because it has been recommended for nationwide use by a U.S. Environmental Protection Agency Task Force.

NOISE SOURCES

Motor Vehicle Noise

Motor Vehicles are the major source of noise in the Escondido area. Noise from motor vehicles affects nearly all areas of the City, and is particularly disruptive near any of the higher volume streets shown in the Circulation Element. While certain vehicles such as trucks, motorcycles, and hot rods generate considerably more noise than others, it is the aggregate noise resulting from high volumes of traffic which most significantly affects Escondido. Traffic levels projected for 1990 in the Circulation Element indicate that noise impact zones will expand significantly in the future.

Speed is an important factor in determining motor vehicle noise emmissions. The following table illustrates that noise emmissions increase as speed increases. The low speed limits of many of Escondido's high volume streets are responsible for limiting both intensity and area of noise exposure.



Motor vehicle noise regulation is largely preempted by federal and state statutes. The Federal Aid Highway Act of 1970 requires noise standards for federally-aided highways. The Federal Government has also promulgated standards for highway noise emmissions for all vehicles engaged in interstate commerce.

The State of California has developed an aggressive strategy for reducing noise emmissions from motor vehicles. Although the State has precluded local government from adopting different motor vehicle noise standards, local governments may enforce State standards. Local agencies may also prohibit or restrict the use of particular highways because of noise considerations. That is, special truck routes may be established, or through traffic prohibited in certain areas or certain quiet zones such as areas near hospitals. Other significant State legislation includes:

Motor Vehicle Code Section 27150 - requires motor vehicles to be equipped with an adequate muffler to prevent excessive noise. This is usually interpreted to mean a muffler no louder than the original stock exhaust system.

Motor Vehicle Code Section 38275 - requires off-highway vehicles to be equipped with an adequate muffler to prevent excessive noise. This law covers one of the most common and disruptive violations; however, enforcement is made difficult by terrain and the mobility of violators.

Motor Vehicle Code Section 38280 - establishes a maximum noise limit for off-road vehicles. Off-road vehicles manufactured after January 1, 1974 may not exceed 86 db(A) at 50'.

Motor Vehicle Code Section 27200 - applies progressively strict standards for maximum noise emmission of motor cycles, trucks and cars. All standards are for vehicles traveling at highway speed measured 50' from the centerline of travel. Originally, this law would have required autos manufactured after 1977 to be quieter than 75 db(A) and cars manufactured after 1987 to be quieter than 70 db(A). However, the legislature has amended this section and frozen the auto noise emmission requirements at 80 db(A) @ 50'. This was done because it had become apparent that constraints of tire, fan and exhaust noise made further reductions impossible within current technology. (See Appendix E.)

Only the sections relating to autos were modified. As amended, the law limits noise emmissions for motorcycles manufactured after 1974 to 80 db(A); after 1977 the limit becomes 75 db(A), and after 1987 the final limit of 70 db(A) becomes effective. Heavy duty truck limits are 83 db(A) for vehicles over 6,000 lbs. manufactured after 1974; units manufactured after 1977 are limited to 80 db(A), and after 1987 the limit is 70 db(A). The limits for motorcycles appear to be attainable; however, the heavy duty truck limits appear to be unrealistic. Wyle Labs has modified heavy duty trucks with the most advanced sound reduction measures, including special tires, mufflers, and modified fan and air intakes. Lowest levels attained for loaded trucks was 79 to 81 db(A)'s. It is likely that the legislature will further modify this section, freezing the limit at 83 db(A). The progressively stricter limits of this section have often been used to project reduced future noise levels. Significant breakthroughs in noise emmissions control have been made; however, further reductions within the pavement-rubber tire technology will be highly limited. For planning purposes, the current limits of 80 db(A) for auto and 83 db(A) for heavy duty trucks should be recognized as the limit to which single event noise can be reduced.

The previously discussed laws clearly develop vehicular noise standards and define violations. Enforcement of these provisions, however, has been lax and irregular. The California Highway Patrol has one noise enforcement team operating in the San Diego and Orange County area, but a greater commitment to enforcement by local jurisdictions will be required if significant reductions in violations is to be achieved. Such enforcement could have positive results by concentrating on the following most common noise sources:

1. Older and unmaintained Heavy duty trucks.
2. Motorcycles with modified or no exhaust systems.
3. "Hot rods" and dune buggies with modified exhaust.
4. Autos and light trucks with poorly maintained exhaust.
5. Vehicles with oversized lug or snow tires.

Reducing these violations would have little effect on aggregate noise levels, but it would greatly change the characteristics of Escondido's noise by reducing disruptive peaks.

AIRCRAFT

The only aircraft facility presently in the planning area is a very small private landing strip operated at the Lake Wohlford Resort. Air traffic is negligible, consisting of approximately 10-15 landings per week and, because of its length and location on a mesa, is generally restricted to single engine light aircraft of less than 200 h.p. Noise contours have not been mapped for this facility due to its insignificance. The landing strip is isolated from urbanized residential areas and there are no known plans for expanding the facility. Noise from this facility is not a problem.

There are no other airports proposed within the planning area, although the General Plan suggests one may be desirable and suggests the possibilities be explored. Helistop or heliport facilities have been discussed occasionally but no sites are currently under consideration. If some form of aircraft facility is proposed it would be required to meet all federal and state regulations as well as being subjected to environmental impact review, including noise abatement. In addition, a permit or letter of permit exemption from the State Division of Aeronautics is required for all public or private landing facilities. Before a permit will be issued, approval must be obtained from the local jurisdiction.

The major flight patterns for military, commercial, and private aircraft do not intrude upon Escondido due to the distance of such facilities from Escondido. No alteration of this condition is anticipated. In summary, noise from aircraft is negligible within the planning area and is not expected to increase.

RAILROADS

The Atchison, Topeka and Santa Fe Railroad Company serves the industrial district with a spur line that ends in Escondido. The railroad right-of-way is totally bounded by industrial uses or zoning within the planning area at the present time.

The railroad operates one round trip daily six days a week. These trips are operated during daylight working hours and at low speeds. No increase in the number of trips is anticipated. Noise contours prepared by Wyle Laboratories for CPO indicate the 60 db(A) line to be well within the railroad right-of-way.

Noise from this source is not a nuisance and is not expected to increase. There are no plans for fixed rail rapid transit systems to serve this area.

NOISE IMPACT ZONES

A noise impact zone is an area which is exposed to levels of noise which are excessive for the existing or intended use of the land. State law requires this element to locate noise contours down to 60db(A) for the entire planning area (Exhibit 1). Noise in excess of 60db(A) is relatively loud and potentially disruptive of outdoor and indoor uses. In addition, noise contours must be plotted below this level for areas involving noise sensitive facilities. These contours are located for the knowledge and well being of the public and, while it is assumed that this information will be used in the decision making process, no specific action to reduce noise is required for this element.

The State Insulation Code defines a noise impact area as having noise greater than 60db(A) (CNEL). The Insulation Code requires an accoustical study for residential development, other than single family detached dwellings, proposed for noise impact zones. The accoustical study is to insure that interior levels do not exceed 45db(A) in any habitable room.

Current vs. 1990 Noise Levels

Current noise level contours are based largely on 1975 traffic levels. Where major changes have occurred in the circulatory system, more recent levels were utilized. Projected 1990 contours are from the Circulation Element and are based on projected growth in both Escondido and the surrounding regions. Comparisons of current and 1990 noise levels show a significant degradation of the noise environment in the Escondido area. Noise contours broaden considerably for nearly all major portions of the circulation system. Because land uses approved now are likely to still be present in 1990, the 1990 projections should be used for design criteria and development review. In computing 1990 noise levels, no reduction in noise per vehicle was assumed. This level may in fact be reduced if the appropriate technology is developed and if legislation requiring lower noise levels is restored. Such a reduction could significantly decrease the number and size of 1990 noise impact zones.

Accuracy of Contours

The contours shown are developed from formulae presented in Development of Ground Transportation System Noise Contours for the San Diego Region by Wyle Laboratories for the Comprehensive Planning Organization. These formulae have been developed from extensive field testing and yield distance to desired contour based on traffic levels, with modifications allowed for configuration of roadway, speed, percentage of

truck traffic, and other minor factors. These formulae are based on the premise that sound pressure levels decrease as one moves away from the source of noise. In general, sound pressure levels are reduced by 6db(A) as the distance from the source to receiver is doubled. As sound pressure levels become smaller, the effect of intervening objects and other noises becomes greater. Therefore, the location of contours which are relatively close to the noise source are considerably more accurate than contours distant from the source.

Field testing of 1975 contours shown in this element was performed as a part of the Community Noise Survey. Field testing was performed with a type 2 ANSI Sound Level Meter in accordance with standard noise testing procedures. Calibration of the instrument was performed before and after all tests. Results of field testing showed that near-peak noise exposures taken close to the source show relatively close agreement with those calculated from the Wyle formula. For the 60 and 65db(A) contours agreement generally was within +3db(A). Within 100 feet of the source agreement was often within +3db(A). Location of the more distant contours (45, 50, 55db(A) contours) showed a much greater variation. Because these contours lie up to 1000 feet from the noise source, the possibility of interference from intervening objects and other noise sources is very great. The attenuation effect of certain large noise barriers such as hills or large buildings was considered, but consideration of the specific attenuation effect of individual buildings, trees, or other objects is beyond the realm of possibility for this study. Further, it would be unwise to attribute attenuation to objects which may not be present in the future. It is therefore recommended that contours developed from the Wyle formulae without considering attenuation of minor barriers, be used for development standards and design criteria. The contour location could be modified for a specific location at the discretion of the noise control officer if it could be shown that significant and permanent attenuation had not been considered in this study.

The individual noise impact areas are discussed in this section with both 60 and 65db(A) contours listed for current and 1990 levels. Characteristics of noise sources and conflicts with land use are also discussed.

STREETS AND HIGHWAYS

Centre City Parkway:

The principal north-south route serving through traffic in the City is Centre City Parkway (Old 395), which passes through Escondido on its way from San Diego to points north. It is currently developed to expressway standards within the City limits, with limited access provided at specific arterial crossings, most of which are signalized. Current traffic levels on this route range up to 19,000 ADT in the central and south segments, and decrease to 6,400 ADT north of El Norte Parkway.

Noise resulting from this level of usage impacts a large area on both sides of the expressway. North of El Norte Parkway the 60db(A) L_{dn} contour is located about 125 feet from the right-of-way on both sides of the expressway. South of Escondido Boulevard the 60db(A) reaches a width of 325 feet on either side of the highway. This noise impact is particularly significant in those areas where the highway is adjacent to multiple residential zones, from Fourth Avenue to Felicita Avenue, and from Highway 78 north to Escondido High School. Future multiple residential development in these noise impact zones will be required to meet the requirements of the State Insulation Code.

CENTRE CITY PARKWAY - 1977

SEGMENT	ADT	L_{dn} @ 50' (db(A))	DISTANCE TO 65db(A) (feet)	DISTANCE TO 60db(A) (feet)
Northerly Junc. 15 to El Norte	6,400	67.3	69	160
El Norte to Highway 78	18,200	71.3	137	315
Highway 78 to Felicita	16,500	71.1	137	315
Felicita to Escondido Blvd.	12,000	69.7	114	268
Escondido Blvd. to Southerly Junction I-15	19,000	71.7	160	370

CENTRE CITY PARKWAY - 1990

SEGMENT	ADT	L_{dn} @ 50' (db(A))	DISTANCE TO 65db(A) (feet)	DISTANCE TO 60db(A) (feet)
Northerly Junction I-15 to El Norte	18,000	72.0	160	370
El Norte to Highway 78	26,000	73.5	188	440
Highway 78 to Felicita	29,000	74.0	223	510
Felicita to Escondido Blvd.	21,000	72.4	160	370
Escondido Blvd. to Southerly Junction I-15	29,000	74.0	223	510

I-15 Bypass:

The I-15 bypass is the primary route for both through traffic and vehicles entering Escondido from the north or south. Current traffic levels range from a low of 13,700 ADT at the north end of the planning area to a high of 48,400 at Lake Hodges. By 1990 these levels are expected to triple, ranging from 68,000 to 145,000 ADT.

Land use along this corridor is primarily low density residential with some industrial zoning at the intersection with State Route 78. There are two areas of R-2 multiple residential zoning which fall within this noise impact zone. These are located adjacent to the freeway where Lincoln and Valley Parkway intersect the freeway.

Noise resulting from the freeway is characterized by high volumes of through and heavy duty truck traffic as well as disruptive late night peak noises from heavy duty trucks. A large number of houses fall within the L_{dn} 60db(A) noise contour. Because most of the area adjacent to the right-of-way is zoned for single family residences, there are no requirements for mitigation of noise levels, although special sound attenuation measures would be highly desirable. Development of those R-2 multiple residential zones will require an acoustical analysis to meet insulation code requirements.

The following table shows distances to noise contours based on existing and projected 1990 traffic levels.

	SEGMENT	ADT	L_{dn} @ 50' (db(A))	DISTANCE TO L_{dn} 65db(A)	DISTANCE TO L_{dn} 60db(A)
I-15 Bypass 1977	North of Centre City Parkway	13,700	69.4	97'	223'
	Centre City to Valley Pkwy.	17,000	70.4	114'	268'
	Valley Pkwy. to Centre City Pkwy.	27,600	72.0	160'	370'
	South of Centre City Parkway	48,400	75.0	223'	510'
I-15 Bypass 1990	North of State 78	68,000	77.0	370'	720
	State 78 to Centre City Parkway	135,000	80.8	640'	1000'
	South of Junction w/ Centre City Pkwy.	145,000	81.0	640'	1000'

State Highway 78:

State Route 78 is the principal east-west regional facility, serving the North County area from the coast through Escondido and on east through Julian. A portion of the route is developed to freeway standards, while the remainder crosses town via surface streets. Because characteristics and changes projected for the two segments of the route vary greatly they will be discussed separately.

Freeway:

State Route 78 is developed to freeway standards from Broadway westerly to beyond the City's planning area. It is currently developed to four lanes and carries up to 27,000 vehicles per day. There is a major traffic interchange with the I-15 bypass. The roadway is projected to be widened to eight lanes and to carry traffic up to 88,000 ADT by 1990. The following tables show the current and projected traffic levels as well as distance to 65 and 60db(A) (L_{dn}) contours for the three segments of the freeway.

Freeway-State Route 78 - 1975

Segment	ADT	L_{dn} @ 50' (db(A))	Dist. to 65db Contour (feet)	Dist. to 60db Contour (feet)
Nordahl to I-15 Bypass	27,000	72.5	188	440
I-15 Bypass to Centre City Pky.	19,000	71.0	137	315
Centre City Pky. to Broadway	12,000	70.0	114	268

Freeway-State Route 78 - 1990

Segment	ADT	L_{dn} @ 50' (db(A))	Dist. to 65db Contour (feet)	Dist. to 60db Contour (feet)
Nordahl to I-15 Bypass	88,000	78.0	440	795
I-15 Bypass to Centre City Pky.	74,000	77.0	370	720
Centre City Pky. to Broadway	32,000	72.8	188	440

Noise from the freeway is characterized by high volumes of truck traffic. A Caltrans truck count for 1974 shows 8.8% heavy duty truck traffic west of the Escondido Expressway. Disruptive late night truck activity is relatively higher than for the rest of town. The noise exposures projected for route 78 are among the highest in the planning area and are exceeded only by the I-15 bypass 1990 projections.

The contours indicate that the 1990 60db(A) (L_{dn}) contour lies between 720 and 795 feet from the outer lane of travel for the segment from Nordahl Road to Centre City Parkway. Most of the land use along the freeway frontage is made up of industrial and commercial uses. While these are relatively high noise exposures, they do not appear to conflict with the intensive industrial and commercial land use. There are, however, a number of residential parcels north of Route 78 between the future I-15 interchange and Broadway. Intrusion of noise is greatest between the I-15 interchange and Centre City Parkway. In this area, all property south of Lincoln lies within the 1990 65db(A) (L_{dn}) contour. The 1990 60db(A) (L_{dn}) contour lies approximately 400 feet north of Lincoln.

Zoning in this noise impact area is R-1-8 and R-2-15. Most of the property is either undeveloped or underdeveloped. Future multifamily development will have to meet the requirements of the State Insulation Code. There are no mitigation requirements for single family dwellings although isolation by insulation or special building techniques should be encouraged. The use of sound attenuation barriers may be practical for portions of this area.

East of Centre City Parkway, lower traffic levels reduce the noise exposures. The 1990 60db(A) (L_{dn}) contour extends 440 feet from the outer lane of traffic. This contour lies just north of Lincoln Avenue. A portion of this area is also subjected to composite exposure from the parkway itself. The majority of this area north of 78 is zoned R-2-15 while the area to the south is zoned commercially. Multifamily development will be required to meet requirements of the State insulation code. The elevated configuration of the freeway precludes the use of sound attenuation barriers.

HIGHWAY 78 (surfact streets)

The former route of Highway 78 left the freeway where it intersects Centre City Parkway. The route then followed the parkway south to Grand Avenue and then proceeded east to Ash and south to the San Pasqual Valley Parkway. With the opening of the Second Avenue Couplet and the closure of Grand Avenue to through traffic, a new route for Highway 78 had to be located. After negotiations with Caltrans the council approved a resolution (#76-32) relocating Highway 78. This Broadway - Washington route is considered as an interim facility to be used only until the Lincoln Avenue is improved to four lanes, which is scheduled for completion in 1979.

When the location of a major east-west facility is considered from a noise control point of view no ideal solution is possible. The former location on Grand Avenue brought large volumes of traffic and heavy duty trucks very close to Palomar Hospital. The adopted interim located on Washington impacts intensely developed residential areas in town. Other routes would also have affected high density residential or noise sensitive facilities, and were considered infeasible without extensive improvements.

In addition to the increase in noise levels, the rerouting of 78 increased heavy duty truck traffic on Washington Avenue. Heavy duty truck traffic on Washington was prohibited from using Washington east of Centre City Parkway, by the "Non-Commercial Routes Ordinance" (No. 1279). This prohibition on trucks in excess of ten tons gross weight was amended to delete the segment between the Escondido Expressway and Ash Street. Peak individual truck noises of 86 db(A) at 50 feet have been measured on Washington.

Land use along the proposed route is commercial along Broadway and high density residential along Washington. Noise levels along Broadway should not be considered excessive for commercial activity. Noise levels along Washington should be expected to cause annoyance and disturbance to occupants of the dwelling units closest to Washington. This condition should be alleviated with the rerouting of Highway 78 to Lincoln Avenue and Ash Street. Reapplication of the prohibition of truck traffic at that time would be highly desirable.

With the exception of commercial land use in the vicinity of Valley Parkway, this parkway system will impact low-density residential areas. Adjacent development will be significantly impacted unless mitigation measures are taken. The following chart shows projected traffic and noise levels for the Ash-Lincoln Parkway, 1990.

Lincoln - Ash Parkway, State Route 78 - 1990

Segment	ADT	L_{dn} at 50' (db(A))	Distance to L_{dn} 65db(A)	Distance to L_{dn} 60db(A)
Broadway to Fig	36,000	72.5	188'	440'
Fig to Ash	21,000	69.8	114'	268'
Lincoln to Oak Hill	28,000	71.3	137'	315'
Oak Hill to 17th	10,000	67.0	69'	160'
17th to Bear Valley	21,000	70.0	114'	268'
Bear Valley to Via Rancho	13,000	68.0	83'	188'

WASHINGTON AVENUE

Washington Avenue is currently improved to four lanes between Quince Street and Citrus Avenue, and is shown as a Collector Street in the Circulation Element. Noise levels now exceed 60 db(A) between Mission Road and Citrus Avenue.

There is a mixture of residential, commercial, and industrial land use in this area. The several residences west of Broadway are non-conforming, however, and thus will give way to commercial and industrial uses over the years.

Traffic levels will decline east of Centre City Parkway with the completion of the Ash-Lincoln Parkway, but will increase west of Centre City Parkway. Projections to 1990 show that noise levels will continue to exceed 60db(A) between Mission Road and Ash Street.

WASHINGTON AVENUE - 1975

	ADT	L _{dn} @ 50'	Distance to 65db	Distance to 60db
Mission Rd. to Centre City Pkwy.	8,000	63.2	-	83'
Centre City Pkwy. to Broadway	16,000	66.0	57'	137'
Broadway to Fig	17,000	66.5	69'	160'
Fig to Ash	18,000	67.5	83'	188'
Ash to Rose	10,000	64.3	-	97'
Rose to Midway	8,000	63.2	-	83'
Midway to Citrus	5,000	61.4	-	57'

Traffic levels will decline east of Centre City Parkway with the completion of the Ash-Lincoln Parkway, but will increase west of Centre City Parkway. Projections to 1990 show that noise levels will continue to exceed 60db(A) between Mission Road and Citrus Ave.

WASHINGTON AVENUE - 1990

	ADT	L _{dn} @ 50'	Distance to 65db	Distance to 60db
Mission Road to Broadway	14,000	67.0	69'	160'
Broadway to Fig	11,000	65.5	57'	137'
Fig to Ash	10,000	65.3	50'	114'
Ash to Midway	7,000	63.6	-	97'
Midway to Citrus	4,000	61.3	-	57'

LINCOLN AVENUE

Currently improved to two lanes, Lincoln Avenue produces noise in excess of 60db(A) between Broadway and Fig Street and between Ash Street and Rose Street. Projections to 1990 show noise levels in excess of 60db(A) between Ash Street and Citrus Street. Projected noise west of this section is detailed under "Highway 78 (surface streets)."

Land east of Ash Street is partially developed to low density residential use. Future development should take noise considerations into account.

LINCOLN AVENUE - 1975

	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Broadway to Fig	4,000	60.9	-	57'
Ash to Rose	4,000	60.9	-	57'

LINCOLN AVENUE - 1990

	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Ash to Rose	10,000	65.3	50'	114'
Rose to Midway	4,000	61.4	-	57'
Midway to Citrus	3,000	60.8	-	57'

ASH STREET

Ash Street is improved to four lanes between Mission and Grand Avenues, and is shown in the Circulation Element as a Collector Street north of Lincoln Avenue and a Major Road south of this point. Traffic noise currently exceeds 60 db(A) between El Norte Parkway and San Pasqual Road. Land use in this area is for the most part low density residential and between Washington Avenue and Ohio Avenue, commercial.

ASH STREET - 1975

	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
El Norte to Lincoln	5,000	61.7	-	69'
Lincoln to Mission	6,000	62.9	-	83'
Mission to Washington	13,000	66.0	57'	137'
Washington to Grand	18,000	67.0	69'	160'
Grand to Oak Hill	16,000	66.8	69'	160'

Traffic on Ash Street north of Lincoln Avenue to Rincon Avenue is projected to produce noise in excess of 60db(A) by 1990. Proper noise mitigation measures on future development should be taken in this area. Noise south of Lincoln Avenue is detailed under "Highway 78 (surface streets)."

ASH STREET - 1990

	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Rincon to Lincoln	11,000	67.3	69'	160'

SAN PASQUAL VALLEY ROAD

South of Ash Street, Highway 78 follows San Pasqual Valley Road. It is currently improved to two lanes, but is shown as a Major Road in the Circulation Element. Noise impact exceeds 60db(A) along the full length of this road.

Existing development along San Pasqual Valley Road is very low density. City and County plans for the most part allow only large lot development, which will minimize the impact of highway noise on residents.

SAN PASQUAL VALLEY ROAD - 1975

	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Ash to Felicita (17th Ave.)	9,000	66.9	69'	160'
Felicita to Bear Valley Parkway	7,100	64.8	50'	114'
Bear Valley Pkwy. to Via Rancho Pkwy.	5,200	64.2	-	97'

Projected noise levels for 1990 are found under "Highway 78 (surface streets)."

FIG STREET

Fig Street is a two lane street, and is shown on the Circulation Element as a Collector between El Norte Parkway and Grand Avenue, and a Local Collector north of this segment to Sheridan Avenue. Current noise levels are low, but are expected to exceed 60 db(A) between El Norte Parkway and Grand Avenue by 1990. Noise levels between Lincoln Avenue and Valley Parkway are expected to exceed 65 db(A).

FIG STREET - 1990

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db (A)	Distance to Ldn 60db (A)
El Norte to Lincoln	6,000	63	-	83
Lincoln to Valley Pkwy.	17,000	68	83	188
Valley Pkwy. to Grand	6,000	63	-	83

BROADWAY

Broadway is shown as a Collector in the Circulation Element. It is currently developed to four lanes from Second Avenue to just north of Escondido High School. The highest current traffic levels occur between Lincoln and Washington, with highest noise exposures affecting commercial land use. The 35 MPH speed limit moderates the level of noise exposure. The following chart shows the 1975 traffic levels and resulting noise contours.

BROADWAY - 1975

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65 db(A)	Distance to Ldn 60dn(A)
Country Club to El Norte	8,000	63	50'	114'
El Norte to Lincoln	11,000	65	50'	114'
Lincoln to Mission	22,000	68	83'	188'
Mission to Washington	18,000	67	69'	160'
Washington to Second Avenue	14,000	66	57'	137'
Second Avenue to Fifth Avenue	9,000	64	-	97'

As development occurs in the north end of town, traffic levels on the northern segments of Broadway will increase. The phased development of the Lincoln-Ash Parkway will reduce traffic levels south of Highway 78. By 1990 the noisiest segment will occur between Lincoln and Rincon. The following chart shows the traffic and noise levels for Broadway in 1990.

BROADWAY - 1990

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65 db(A)	Distance to Ldn 60db(A)
Rincon to El Norte	16,000	69	97'	223'
El Norte to Lincoln	23,000	69	97'	223'
Lincoln to Second Avenue	13,000	67	69'	160'
Second Avenue to Fifth Avenue	4,000	61	-	57'

Noise exposures in the commercial areas are within the compatible range, and are not expected to increase significantly by 1990. North of Lincoln, where traffic levels increase the most, Broadway noise exposures will affect single and multifamily housing as well as Escondido High School. While these exposures are higher than the suggested noise level limits for residential land uses, mitigation through building site location and special construction techniques should provide acceptable interior noise levels. Classroom buildings of Escondido High School are set back sufficiently to reduce noise impact to acceptable levels.

ESCONDIDO BOULEVARD

Escondido Boulevard is a low speed, relatively low volume street which services primarily commercial land use. The Circulation Element designates it as a Local Collector where it fronts on Centre City Parkway, and as a Collector north of where it leaves the Parkway. The highest noise exposures occur between Mission and Second Avenue. Traffic north of Mission does not produce significant noise levels. The following chart shows the 1975 traffic and noise levels.

ESCONDIDO BLVD. - 1975

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Mission to Second Avenue	16,000	66	57'	137'
Second Ave. to Ninth Avenue	12,000	65	50'	114'
Ninth Ave. to Felicita Avenue	10,000	65	50'	114'
Felicita Ave. to Brotherton Rd.	7,000	62.6	-	83'

Changes in circulation patterns are expected to maintain and even reduce current usage levels on Escondido Boulevard. The following chart shows the traffic and noise levels projected for 1990.

ESCONDIDO BLVD. - 1990

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Centre City Pkwy. to Mission Ave.	6,000	63	-	83'
Mission Ave. to Second Avenue	13,000	67	69'	160'
Second Avenue to Brotherton Road	12,000	66	57'	137'

Most of the land use that fronts on Escondido Boulevard is developed to either commercial or non-conforming residential usage. This development effectively screens adjacent residential streets from Escondido Boulevard noise. The commercial land use that fronts on Escondido Boulevard should not be adversely affected by these noise levels.

VALLEY PARKWAY

Valley Parkway is an important east - west facility, which serves a number of functions as it passes across Escondido. On the outskirts of town, Valley Parkway serves as a prime arterial bringing both through and local traffic into the central portion of the City. In the central part of the City, Valley Parkway services both the Central Business District and the various retail centers along East Valley Parkway. This combination arterial service and commercial service results in high volumes of traffic, and large numbers of heavy duty trucks. The following table shows 1975 traffic and noise levels for Valley Parkway.

VALLEY PARKWAY - 1975

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Del Diablo to Tulip	6,000	68.5	97'	223'
Tulip to Centre City Pkwy.	5,000	63.4	-	83'
Centre City to Hickory	13,000	67.7	83'	188'
Hickory to Ash Street	23,000	67.8	83'	188'
Ash Street to Rose	24,000	68.0	83'	188'
Rose to Midway	18,000	67.2	69'	160'
Midway to Citrus	12,000	67.5	83'	188'
Citrus to Bear Valley	7,000	65.0	50'	114'
Bear Valley to El Norte Pkwy.	8,700	66.2	57'	137'

Highest traffic and noise levels occur between Hickory and Rose. These levels are potentially disruptive to commercial and retail activities located very close to Valley Parkway, and would be even higher were it not for the 35 mph speed limit.

Single event peak noises resulting from heavy duty truck traffic are also disruptive to commercial and retail uses. Speech interference, distraction, loss of concentration and a generally noisy environment all have a negative effect on commercial productivity and retail activities. Most of the large shopping centers are set back sufficiently to not be affected. Commercial development between Escondido Blvd. and Ash lacks setbacks and is almost entirely within the 65db(A) Ldn contour. Projected 1990 traffic levels indicate that noise levels will continue to increase. Noise levels in the commercial areas will increase by one to three decibels and increase to greater than 70db(A) Ldn for all of West Valley Parkway west of Tulip. The following table shows projected 1990 noise and traffic levels for Valley Parkway.

VALLEY PARKWAY - 1990

Segment	A.D.T.	Ldn at 50' (db(A))	Distance to 65 db contour (feet)	Distance to 60 db contour (feet)
Citracado to 11th	30,000	71.5	160	370
11th to I-15 Bypass	35,000	70.0	114	268
I-15 Bypass to Tulip	44,000	71.3	137	315
Tulip to Centre City Parkway	22,000	68.0	83	188
Centre City Parkway to Escondido Blvd.	25,000	68.5	97	223
Escondido Blvd. to Fig	24,000	68.4	83	188
Fig to Ash	30,000	68.4	83	188
Ash to Rose	28,000	69.0	97	223
Rose to Midway	18,000	70.2	114	268
Midway to Bear Valley	12,000	67.5	83	188

The most significant increase in noise over the 1975 levels occur in the West Valley Parkway area. The opening of the I-15 Bypass and projected increased levels of development in the southwest quadrant of the City are responsible for increased traffic and noise levels on West Valley Parkway. With the opening of the I-15 Bypass, West Valley Parkway has become the main access point for industrial and commercial areas. West of Tulip, West Valley Parkway services primarily residential land use. Projected 1990 noise levels are very high for a residential area, and should be expected to cause annoyance and sleep disruption for persons living close to the Parkway. The limited R-2 zoned property will have to meet State Insulation Code requirements at the time of development, however, detached single family development is not covered by the noise insulation code. Future detached single family residential developments along Valley Parkway should be urged to mitigate noise levels through attenuation, insulation, or isolation measures.

VALLEY BOULEVARD

Valley Boulevard is a short, one block connector between Valley Parkway and Grand Avenue. Average noise levels currently exceed 60db(A) and are projected to exceed 65db(A) by 1990. Large trucks using this street create particularly loud peak levels, disturbing adjacent residential and office uses. Zoning is H-P on the east side of the street and CBD on the west.

VALLEY BLVD.

	Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
1975	Valley Parkway to Grand Avenue	8,000	63.7	-	97'
	Valley Parkway to Grand Avenue	18,000	66.8	69'	160'

Grand Avenue - Second Street

The opening of the Second Street couplet has changed Grand Avenue within the CBD from a through Collector to a shopping street. This has reduced traffic and noise levels on Grand Avenue and rerouted through traffic to Valley Parkway and Second Avenue. East of the CBD, Grand continues to serve as a Collector.

Grand 1975	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Centre City Pkwy. to Valley Blvd.	10,000	64.4	-	97'
Valley Blvd. to Ash Street	17,000	67.0	69'	160'
Ash Street to Rose	10,000	64.4	-	97'
Rose to Midway	6,000	62.2	-	69'

Second Avenue 1976	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Tulip to Centre City Parkway	5,000	63.4	-	83'
Centre City Parkway to Grand Avenue	12,000	65.0	50'	114'

In general, these levels for both Grand Avenue and Second Avenue should not be disruptive of adjacent land use; however, single event peak noise from heavy duty trucks on these streets may cause some disruption of commercial and professional activities.

By 1990 traffic levels on both Second Street and Grand east of the CBD are projected to increase significantly. The following tables show projected traffic and noise levels for 1990:

Second Avenue - 1990	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Tulip and Centre City Pkwy.	17,000	67.3	69'	160'
Centre City Pkwy. and Grand Ave.	21,000	68.5	97'	223'

Grand Avenue - 1990	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Centre City Pkwy. to Valley Blvd.	10,000	64.4	-	97'
Valley Blvd. to Ash Street	20,000	68.0	83'	188'
Ash Street to Rose	16,000	67.2	69'	160'
Rose to Midway	10,000	65.3	50'	114'
Midway to Bear Valley	8,000	60.3	-	50'

Mission Road and Mission Avenue

Mission Avenue and Mission Road are east-west facilities which serve industrial, commercial and residential land uses. The characteristics of traffic and road configuration vary greatly with land uses served. Mission Road is a two lane roadway that carries a high volume of heavy duty truck traffic. From the I-15 bypass to Broadway, Mission Avenue is a four lane roadway which services commercial areas and collects traffic from surrounding residential and industrial areas. This is the busiest and the noisiest segment of the roadway. East of Broadway, Mission Avenue runs through high density residential land use first as a four lane roadway and then as a two lane roadway. East of Ash, Mission Avenue continues as a two lane roadway servicing low density single family land use. Noise exposures resulting from the 1975 noise exposures on Mission range from 61 to 68db(A) Ldn at 50 feet. The following table shows the traffic and noise levels from Mission Road and Mission Avenue, 1975.

Mission Road - 1975

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Nordahl to Enterprise	13,000	66.0	57'	137'
Enterprise to Mission Avenue	16,000	67.0	69'	160'
Mission Avenue to Washington Ave.	6,000	62.0	-	69'

Mission Avenue - 1975

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Mission Road to Rock Springs Rd.	16,000	67.0	69'	160'
Rock Springs to Centre City Pkwy.	17,000	67.0	69'	160'
Centre City to Broadway	22,000	67.5	83'	188'
Broadway to Fig Street	15,000	66.5	69'	160'
Fig Street to Ash Street	13,000	65.5	57'	137'
Ash Street to Rose	8,000	63.7	-	97'
Rose to Midway Ave.	7,000	63.1	-	83'
Midway Ave. to Citrus Avenue	4,000	60.9	-	57'

For industrial and commercial activities, these levels are not excessive nor disruptive. However, the noise exposures between Broadway and Ash are higher than desirable and are disruptive to those persons living closest to Mission Avenue. Projected changes in circulation resulting from the opening of the Lincoln - Ash Parkway should reduce the 1990 levels to 65db(A) Ldn at 50 feet for all residential areas adjacent to Mission Avenue. These levels could be further reduced by eliminating heavy duty truck traffic from the residential areas (east of Park Place). The following table shows the projected traffic noise levels for Mission Avenue, 1990.

Mission Road - 1990

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Nordahl to Washington Ave.	18,000	67.5	83'	188'

Mission Avenue - 1990

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Mission Road to Rock Springs Road	6,000	62.0	-	69'
Rock Springs Rd. to Quince	13,000	66.7	69'	160'
Quince to Centre City Parkway	16,000	67.2	69'	160'
Centre City Pkwy to Escondido Blvd.	21,000	68.0	83'	188'
Escondido Blvd. to Broadway	16,000	67.2	69'	160'
Broadway to Rose	10,000	65.3	50'	114'
Rose to Midway	7,000	63.6	-	97'
Midway to Citrus	4,000	61.3	-	57'

FELICITA (17th Avenue):

The Circulation Element shows Felicita Avenue as a collector except for the segment between Centre City Parkway and Juniper. It is currently developed to only two lanes and carries between 6,000 and 9,000 vehicles on its busiest sections. Noise levels exceed 60db(A) west of Juniper Street. Increased development in the area is projected to increase traffic levels. The following tables show the 1975 and 1990 traffic and noise levels for Felicita Avenue.

FELICITA AVENUE (17th Ave.) - 1975

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Via Rancho to Centre City Pkwy.	6,000	63.4	-	83
Centre City Pkwy. to Escondido Blvd.	7,000	63.1	-	83
Escondido Blvd. to Juniper Street	9,000	64.0	-	97

FELICITA AVENUE 917th Ave.) - 1990

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Via Rancho to Hamilton	7,000	60.9	-	57
Hamilton to Citracado Pkwy.	17,000	69.5	114	268
Citracado Pkwy. to Tulip	21,000	68.5	97	223
Tulip to Juniper	30,000	69.5	114	268
Juniper to San Pasqual Valley Pky.	17,000	69.5	114	268

According to these projections, noise levels along Felicita will be just under 70db(A). These levels will be disruptive to residences located close to Felicita. In general, commercial activity along Felicita is set back sufficiently to prevent disruption of retail activities.

COUNTRY CLUB LANE:

This Collector Street was completed in 1976, and currently exceeds 60db(A) between I-15 and Broadway. Additional residential development in the area will result in the extension of the noise impact area along the full length of Country Club Lane by 1990.

COUNTRY CLUB LANE - 1975

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Centre City to Broadway	6,000	64.3	-	97'

COUNTRY CLUB LANE - 1990

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
El Norte to Centre City	5,000	62.2	-	69'
Centre City to Broadway	12,000	67.3	69'	160'

Development along Country Club is both single family and multiple residential. Mitigation measures should be taken as needed for new development.

ROCK SPRINGS ROAD:

Rock Springs Road is shown as a Collector, and traverses single family residential commercial, and industrial areas. Noise levels do not now exceed 60db(A), but are projected to do so by 1990. However, the residential areas will experience noise exposures only slightly exceeding the 60db(A) noise impact limit.

ROCK SPRINGS ROAD - 1990

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Bennett to Highway 78	4,000	61.3	-	57'
Highway 78 to Washington	6,000	63.2	-	83'

TULIP STREET:

Noise levels on this street now exceed 60db(A) north of Valley Parkway, an industrial area with several nonconforming residences. South of Valley Parkway, where Tulip Street is designated as a Local Collector, noise levels are projected to exceed 60db(A) by 1990. This includes both single family and multifamily areas which may be disturbed by these levels.

TULIP STREET - 1975

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Hale to Valley Pkwy.	7,000	63.2	-	83'

TULIP STREET - 1990

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Hale to Valley Pkwy.	7,000	63.2	-	83'
Valley Pkwy. to Ninth	4,000	61.0	-	57'
Ninth to Thirteenth	6,000	62.8	-	57'
Thirteenth Felicita	8,000	63.7	-	97'

QUINCE STREET:

Quince Street is shown as a Collector north of Ninth Avenue, and currently exceeds 60db(A) on this section. All but the southerly three blocks of this section is in an industrial area. 1990 noise is expected to exceed 60db(A) south to Thirteenth Avenue, exposing an additional multifamily residential area.

QUINCE STREET - 1975

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Mission to Valley	5,000	61.4	-	57'
Valley to 2nd	6,000	62.2	-	69'
2nd to 5th	7,000	62.9	-	83'
5th to 9th	5,000	61.4	-	57'

QUINCE STREET - 1990

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Mission Ave. to Washington Ave.	4,000	62.8	-	83'
Washington to Thirteenth Ave.	6,000	64.0	-	97'

NINTH AVENUE:

Most of Ninth Avenue is designated as a Collector in the Circulation Element. It serves as a major access route to the area west of I-15, and an interchange provides access to I-15 itself. Noise levels exceed 60db(A) west of Escondido Boulevard. All of Ninth Avenue is projected to exceed 60db(A) by 1990. These noise levels may be disruptive where they contact residential areas.

NINTH AVENUE - 1975

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Valley Pkwy. to Centre City Pkwy.	5,000	61.6	-	69'
Centre City to Escondido Blvd.	7,000	63.2	-	83'

NINTH AVENUE - 1990

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Valley Pkwy. to I-15	10,000	65.3	50'	114'
I-15 to Quince	4,000	61.3	-	57'
Quince to Centre City Pkwy.	10,000	65.3	50'	114'
Centre City to Escondido Blvd.	12,000	66.0	57'	137'
Escondido Blvd. to Juniper Street	4,000	61.4	-	57'
Juniper to Chestnut	3,000	60.4	-	50'

JUNIPER STREET:

This Collector Street currently exceeds 60db(A) north of Felicita Avenue in both commercial and residential areas. Noise levels will begin to exceed 60db(A) south of Felicita Avenue, a single family residential area, in 1990.

JUNIPER STREET - 1975

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Washington Ave. to Fifth Ave.	6,000	62.4	-	69'
Fifth Ave. to Ninth Avenue	8,000	63.7	-	97'
Ninth Ave. to Thirteenth Ave.	7,000	63.2	-	83'
Thirteenth Ave. to Felicita	6,000	62.4	-	69'

JUNIPER STREET - 1990

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Washington Ave. to Ninth Ave.	7,000	63.4	-	83'
Ninth Ave. to Chestnut	6,000	63.0	-	83'
Chestnut to Felicita	16,000	67.0	69'	160'
Felicita to Vermont	4,000	61.4	-	57'
Sunset to Bear Valley	4,000	61.4	-	57'

ROSE STREET:

Rose Street is shown as a Collector between Lincoln Avenue and Grand Avenue and a Local Collector north and south of this section. A noise impact area exists between El Norte Parkway and Grand Avenue, a segment which includes single family, multifamily, and commercial areas. The 1990 impact area is projected to extend south to Oakhill Drive.

ROSE STREET - 1975

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65 db(A)	Distance to Ldn 60db(A)
El Norte Pkwy. to Mission Ave.	4,000	61.9	-	69'
Mission Ave. to Washington	7,000	63.2	-	83'
Washington to Valley Pkwy.	10,000	64.4	-	97'
Valley Pkwy. to Grand Avenue	11,000	64.8	50'	114'

ROSE STREET - 1990

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65 db(A)	Distance to Ldn 60db(A)
El Norte to Lincoln	4,000	61.3	-	57'
Lincoln to Mission	10,000	64.4	-	97'
Mission to Washington	12,000	65.0	50'	114'
Washington to Valley Pkwy.	14,000	66.6	69'	160'
Valley Pkwy. to Grand	10,000	64.4	-	97'
Grand Ave. to Oakhill	4,000	61.3	-	57'

MIDWAY DRIVE:

Midway Drive, a Collector Street, services all density levels of residential use and a small amount of commercial use at Valley Parkway. A noise impact area currently exists on all of Midway Drive. Changes in traffic patterns will reduce the noise impact area to the section between Washington Avenue and Grand Avenue, half of which is designated for commercial use.

MIDWAY DRIVE - 1975

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
E1 Norte Pky. to Mission Ave.	4,000	60.9	-	57'
Mission Ave. to Washington Ave.	6,000	62.4	-	69'
Washington Ave. to Valley	9,000	64.0	-	97'
Valley to Oak Hill	8,000	63.7	-	92'
Oak Hill to Bear Valley	6,000	62.4	-	69'

MIDWAY DRIVE - 1990

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Washington Ave. to Grand Avenue	6,000	63.8	-	97'

CITRUS AVENUE:

Citrus Avenue is a Local Collector servicing areas designated for low and medium density residential use. Noise levels are currently minimal, but are projected to exceed 60db(A) by 1990.

CITRUS AVENUE - 1990

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Mission Ave. to Washington Ave.	4,000	61.6	-	69'
Washington to Bear Valley	6,000	63.4	-	83'

OAKHILL DRIVE:

Oakhill Drive is designated as a Collector and contacts both low and high density residential areas. It is currently classified as a noise impact zone, and traffic and noise is expected to worsen in the high density area, but lessen in the low density area.

OAKHILL DRIVE - 1975

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Ash Street to Bear Valley Pkwy.	4,000	60.9	-	57'

OAKHILL DRIVE - 1990

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Ash Street to Rose Street	6,000	63.9	-	97'

Peripheral Parkway System

The peripheral parkway system is made up of a number of developed and undeveloped major roads that surround the City. The function of these roads is to provide access from one side of the City to another without going through the center of town. In general, these roads service low and low-low density residential land use. Current usage levels are fairly low reflecting the low levels of development on the outer edges of the City. As development becomes more intensive, traffic and noise levels associated with these parkways will increase. Along already existing parkways, residential uses have developed to a considerable degree. Many of the houses along the parkways are within or will be within 60db(A) Ldn noise contours. In most cases mitigation of these noise levels is not feasible because of the extreme length of the system. Further development proposals should attempt to design in such a way as to reduce resulting noise exposures. The following is a discussion of the individual elements of the peripheral parkway system.

VIA RANCHO PARKWAY

While current traffic levels on Via Rancho Parkway are relatively low, the higher speeds result in significant noise levels. Traffic is higher west of

I-15, but is expected to increase more rapidly east of the freeway to San Pasqual Valley Parkway. Disturbance to surrounding residential uses will be minimized by the very low densities of development allowed in this area, as well as the hilly terrain.

VIA RANCHO PARKWAY - 1975

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65 db(A)	Distance to Ldn 60 db(A)
Del Dios Highway to Felicita Rd.	3,900	66.3	57'	137'
Felicita Rd. to I-15	6,000	68.0	83'	188'
I-15 to Bear Valley Pkwy.	5,000	67.3	69'	160'
Bear Valley Pkwy. to San Pasqual Valley Rd.	2,200	63.7	-	97'

VIA RANCHO PARKWAY - 1990

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65 db(A)	Distance to Ldn 60 db(A)
Del Dios Hwy. to Felicita	3,000	62.3	-	69'
Felicita to I-15	9,000	67.7	83'	188'
I-15 to Bear Valley Pkwy.	36,000	75.0	268'	575'
Bear Valley to San Pasqual	10,000	69.5	114'	268'

BEAR VALLEY PARKWAY:

Parts of Bear Valley Parkway currently exceed 60db(A) Ldn. By 1990 major increases in traffic and noise are projected. The following table shows current and 1990 traffic and noise levels.

BEAR VALLEY PARKWAY - 1975

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65 db(A)	Distance to Ldn 60 db(A)
Midway to Glenridge	7,000	64.6	50'	114'
Glenridge to Rose	6,000	63.0	-	83'
Rose St. to San Pasqual Vly. Rd.	11,000	66.6	69'	160'
San Pasqual to Sunset Drive	9,000	66.0	57'	137'
Sunset Drive to Via Rancho Pkwy.	11,000	66.6	69'	160'

Bear Valley Parkway - 1990

Segment	ADT	Ldn at 50' (db(A))	Dist. to 65db Contour (feet)	Dist. to 60db Contour (feet)
Valley Parkway to Midway	20,000	70	114	268
Midway to San Pasqual Valley Parkway	28,000	72	160	370
San Pasqual Valley Pky. to Sunset	24,000	71	137	315
Sunset to Via Rancho Parkway	31,000	72	160	370

EL NORTE PARKWAY:

El Norte Parkway is an east-west facility which serves the northern portion of the City. Current traffic levels range from 4,000 to 7,000 ADT, producing noise levels in excess of 60db(A) between Borden Road and Citrus Avenue. Residential use east of Broadway is heavily developed. Future traffic levels are projected to increase significantly. The following table lists current and projected traffic and noise levels.

EL NORTE PARKWAY - 1975

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Borden Road to Centre City Pkwy.	5,000	63.0	-	83'
Centre City Pkwy. to Broadway	6,000	63.8	-	97'
Broadway to Ash Street	7,000	64.5	50'	114'
Ash Street to Rose Street	5,000	63.0	-	83'
Rose Street to Citrus Ave.	4,000	61.8	-	69'

EL NORTE PARKWAY - 1990

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Borden Road to Centre City Pkwy.	14,000	69	97'	233'
Centre City Pkwy. to Broadway	22,000	70	114'	268'
Broadway to Rose Street	18,000	70	114'	268'
Rose Street to Midway	12,000	68	83'	188'
Midway to Citrus Avenue	8,000	61.3	-	57'
Washington to Valley Center Rd.	4,000	61.3	-	57'

CITRACADO PARKWAY:

Citracado Parkway as a through facility is almost totally undeveloped, and as such it is not a current source of significant noise. In the future it will provide service to the southwest quadrant of the City. Eventually the Parkway will connect the I-15 bypass with Highway 78. The following table shows projected traffic and noise levels for 1990.

CITRACADO PARKWAY - 1990

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
State Route 78 to Del Dios Hwy.	10,000	68	83'	188'
Del Dios Hwy. to I-15 Bypass	18,000	70	114'	268'

County Highway S-6 (Del Dios Highway and Valley Center Road)

County Highway S-6 services rural areas to the northeast and southwest of Escondido. In the southwest S-6 is known as the Del Dios Highway, and in the northeast as Valley Center Road. Both of these roads are two-lane rural highways which run through generally steep hills containing only scattered development. All of Highway S-6 currently exceeds 60db(A) Ldn.

DEL DIOS HIGHWAY - 1975

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Lake Hodges Dam to Avenida del Diablo	5,000	67.0	69'	160'

VALLEY CENTER ROAD - 1975

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
El Norte Pky to Plan Area Limit	7,200	68.1	83'	188'

Projected increases in development will result in significant increases in traffic and noise, on both Del Dios Highway and Valley Center Road. The following tables show projected 1990 noise and traffic levels for these roadways.

DEL DIOS HIGHWAY - 1990

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Hodges Dam to Citracado	25,000	73.5	233'	510'

VALLEY CENTER ROAD - 1990

Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Bear Valley Pkwy to to El Norte Pkwy.	17,000	69.0	97'	233'
El Norte to Lake Wohlford Road	19,000	72.0	160'	370'
Lake Wohlford Road to Edge of Area	14,000	69.2	97'	223'

These noise levels are the result of large volumes of traffic traveling at high speed. These levels will be disruptive to the rural atmosphere through which these roads pass. The distances to contours listed are conservative and do not consider the effect of terrain on sound. Where adjacent property falls off steeply downhill, or where road cuts screen the line of sight, the distance to noise contours may be reduced by as much as half. Conversely, terrain may focus noise in certain locations yielding higher than normal exposures. For those areas of gentle terrain (nearby or within the City boundaries) the contours are correct within the margin of error.

MINOR IMPACT AREAS

The following noise impact areas are all less than one mile in length. Each involves a Collector or Local Collector, and generally have lower levels of noise impact.

1975	Segment	ADT	Ldn @ 50' (db(A))	Distance to Ldn 65db(A)	Distance to Ldn 60db(A)
Hale Ave.	Washington to Vineyard	5,000	61.6	-	69'
Fifth Ave.	Centre City to Escondido Blvd.	6,000	62.4	-	69'
	Escondido Blvd. to Juniper	5,000	61.6	-	69'
Chestnut Street	Juniper to Fifth Ave.	6,000	64.3	-	97'
Date St.	Grand Ave. to Fifth Ave.	6,000	62.4	-	69'
1990	Nordahl Road	Rock Springs to El Norte Pkwy.	7,000	63.7	97'
Borden Rd.	Rock Springs to Avocado	6,000	67.4	50'	114'
Hale Ave.	Industrial to Vineyard	8,000	63.6	-	97'
Fifth Ave.	Centre City to Escondido Blvd.	10,000	65.3	50'	114'
	Chestnut to Ash Street	10,000	65.3	50'	114'
Thirteenth Ave.	Centre City to Escondido Blvd.	8,000	64.0	-	97'
	Escondido Blvd. to Juniper	4,000	61.3	-	57'
Chestnut Street	Juniper to Fifth Avenue	12,000	68.0	83'	188'



NOISE IMPACT ZONES

STREETS ON WHICH TRAFFIC NOISE IS EXPECTED TO EXCEED 60db(A) IN 1990

EXHIBIT 1

COMMUNITY NOISE EXPOSURE INVENTORY

This noise exposure inventory is an estimate of the current and projected numbers of persons residing within noise impact zones, or areas exceeding Ldn 60db(A). The inventory for 1975 utilizes the previously established noise contours in conjunction with 1975 aerial photos. Average household sizes for the various dwelling unit types counted were derived from the 1975 Special Census. The 1990 inventory utilizes the projected noise contours, General Plan land use designations, projected degree of development, and projected family size.

This inventory shows that approximately 8,000 persons are currently exposed to exterior traffic noise in excess of 60db(A), constituting 13% of the General Plan Area population. Approximately 2,000 persons or 3% of the population is exposed to levels exceeding Ldn 65db(A).

By 1990 large population and density increases will produce even larger increases in impacted population. It is estimated that over 32,000 persons or 30% of the plan area population will experience exterior noise in excess of 60db(A), and 14,000 or 13% will experience noise in excess of Ldn 65db(A). However, with the implementation of state noise insulation standards, and assuming these standards are applied to single family as well as multifamily dwellings as proposed in this element, interior noise levels should be reduced from their current levels. While most of the population identified in the 1975 noise exposure inventory experiences interiors noise levels in excess of Ldn 45db(A), all new dwelling units will be required to show that interior levels will not exceed 45db(A) through insulation techniques. Thus, as existing dwelling units are replaced, the population experiencing high interior noise levels will decrease.

COMMUNITY NOISE EXPOSURE INVENTORY

1975

STREET	SEGMENT	IMPACTED 60 db(A)	POPULATION 65 db(A)
I-15	A11	282	43
Highway 78	A11	171	22
Centre City Pkwy.	A11	801	502
Country Club Lane	I-15 to Broadway	22	-
E1 Norte Pkwy.	Borden to Citrus	410	56
Lincoln Avenue	Broadway to Fig	74	-
	Ash to Rose	146	-
Mission Road	A11	22	-
Mission Avenue	Mission Rd. to Citrus	1126	355
Washington Ave.	Mission Rd. to Citrus	1250	466
Del Dios Hwy.	A11	31	17
Valley Pkwy.	A11	238	148
Valley Center Rd.	A11	16	16
Grand Ave.	A11	701	118
Second Avenue	Quince to Ivy	251	62
Valley Boulevard	A11	17	-
Fifth Avenue	Centre City to Juniper	88	-
Oakhill Avenue	A11	211	-
Ninth Avenue	Valley to Escondido	102	-
Felicita Avenue	A11	181	-
Via Rancho Pkwy.	A11	99	0
Hale Avenue	Washington to Vineyard	31	-
Tulip Street	Hale to Valley	20	-
Quince Street	Mission to Ninth	37	-
Escondido Blvd.	Mission to Centre City	168	112
Broadway	Rincon to Fifth	349	120
Juniper Street	Washington to Felicita	249	-
Chestnut Street	Juniper to Fifth	136	-
Date Street	Grand to Fifth	62	-
Ash Street	E1 Norte to San Pasqual	260	109
San Pasqual Rd.	A11	87	16
Rose Street	E1 Norte to Grand	304	-
Midway Drive	A11	205	-
 Total		8147	2162
 % of Total Population		13%	3%

COMMUNITY NOISE EXPOSURE INVENTORY

1990

STREET	SEGMENT	IMPACTED 60 db(A)	POPULATION 65 db(A)
I-15	A11	9377	5473
Highway 78	A11	950	483
Centre City Pkwy.	A11	1794	774
Country Club Lane	A11	230	73
Nordahl Road	Rock Springs to El Norte	35	-
El Norte Pkwy.	Borden to Citrus	1273	546
Rock Springs Road	Bennett to Washington	57	-
Borden Road	Rock Springs to Avocado	175	-
Lincoln Avenue	A11	733	274
Mission Avenue	Mission Rd. to Citrus	871	305
Washington Avenue	Mission Rd. to Citrus	1141	287
	El Norte to Valley	64	-
Del Dios Hwy.	A11	881	384
Valley Pkwy.	A11	1143	495
Grand Avenue	A11	1471	450
Fifth Avenue	Centre City to Escondido	152	67
Oakhill Avenue	Ash to Rose	193	-
Vineyard Street	Venture to Valley	51	-
Ninth Avenue	A11	330	39
Thirteenth Ave.	Centre City to Juniper	74	-
Felicita Avenue	A11	1018	438
Via Rancho Pkwy.	A11	569	201
Citracado Pkwy.	Mission Rd. to I-15	1253	549
Tulip Street	A11	192	-
Quince Street	Mission to Thirteenth	92	-
Escondido Blvd.	A11	121	38
Broadway	Rincon to Fifth	1219	530
Juniper Street	Washington to Vermont	572	121
Sunset Drive	Juniper to Bear Valley	17	-
Fig Street	El Norte to Grand	806	333
Ash Street	A11	1167	505
San Pasqual Road	A11	388	166
Rose Street	El Norte to Oakhill	405	144
Midway Drive	Washington to Grand	65	-
Citrus Avenue	Mission to Bear Valley	143	-
Bear Valley Pkwy.	A11	3086	1338
 Total		32,108	14,013
 % of Total Population		30%	13%

NOISE SENSITIVE FACILITIES

In addition to the requirements for the location of the 60db(A) contours, Government Code Section 65302 (g) requires noise contours in 5db increments below the 60db(A) noise level for regions involving hospitals, rest homes, long-term medical or mental care facilities, outdoor recreation areas and schools. In fulfilling this requirement one hospital, five convalescent homes, five parks or outdoor recreation areas, and sixteen public schools were studied for noise exposures down to Ldn 45db(A).

Palomar Hospital:

Palomar Hospital (Exhibit 2) is located between two major noise generators: Grand Avenue and Valley Parkway. Exterior noise exposures near the hospital building are between 55 and 60db(A) Ldn. The lowest noise contour located was 55db(A) Ldn. Interior noise levels inside the hospital building were monitored to determine whether transportation noise was at potentially disruptive levels. Sound level readings were taken on a number of different floors, in rooms closest to roadways with windows closed. Interior noise levels ranged from less than 40db(A) to 43db(A). A single event peak of 48db(A) resulting from a passing truck was recorded on the ninth floor. Traffic noise is audible from interior rooms of the hospital but these levels are not considered disruptive or intrusive.

Convalescent Homes:

Of the five convalescent homes studied (Exhibits 3-7) all but one had exterior noise exposures of between 55 and 60db(A) Ldn, with the lowest contour located being 55db(A) Ldn. No interior monitoring of these facilities was conducted, but normal attenuation from buildings should produce acceptable interior noise levels.

Parks and Recreation Facilities:

Five parks and outdoor recreation areas were studied (Exhibits 8-12). Grape Day Park and Washington Park are both in close proximity to busy streets. 65db(A) Ldn was the maximum contour, and the 55db(A) Ldn was the lowest contour located. West-side Park is located a considerable distance from traffic noise. The only noise contour which crosses the park is the 45db(A) Ldn contour. Its location adjacent to the industrial area creates some potential for future industrial noise disruption. Kit Carson Park is subject to noise exposure from I-15, Centre City Parkway, Via

Rancho Parkway, and Bear Valley Parkway. The 60db(A) contour from Centre City Parkway intrudes nearly 500 feet into the park; however, noise exposure from Via Rancho and Bear Valley is more moderate. As a result a large section in the interior of the park is exposed to noise levels less than 50db(A) Ldn. A small section of 45db(A) Ldn is located in the vicinity of the Arroyo de Oro section of the park. Future landscaping will not significantly affect sound levels at Kit Carson Park. Lake Wohlford and Dixon Dam are both isolated from any significant noise source. Traffic levels at the present time are so low that noise contours cannot be accurately projected. This lack of noise generators should produce noise exposures of less than 45db(A) Ldn. Land for a proposed park at Rock Springs and the I-15 bypass has been acquired and is scheduled for development in the near future. Projected 1978 traffic on the I-15 bypass will yield exposures greater than 60db(A) Ldn for half of the park. The entirety of the park will be exposed to noise greater than 55db(A) Ldn. By 1990 the site will be exposed to noise greater than 65db(A) Ldn.

Schools:

Noise contours for all public schools were plotted (Exhibits 13-28), including ten elementary, three middle, and three high schools. Most schools are located on or near a major street, resulting in exterior noise levels up to Ldn 69db(A). However, exterior noise levels adjacent to structures do not exceed 65db(A) and interior levels do not exceed 50db(A). State standards for schools call for interior noise level peaks of under 50db(A) (Section 216, Streets and Highways Code).

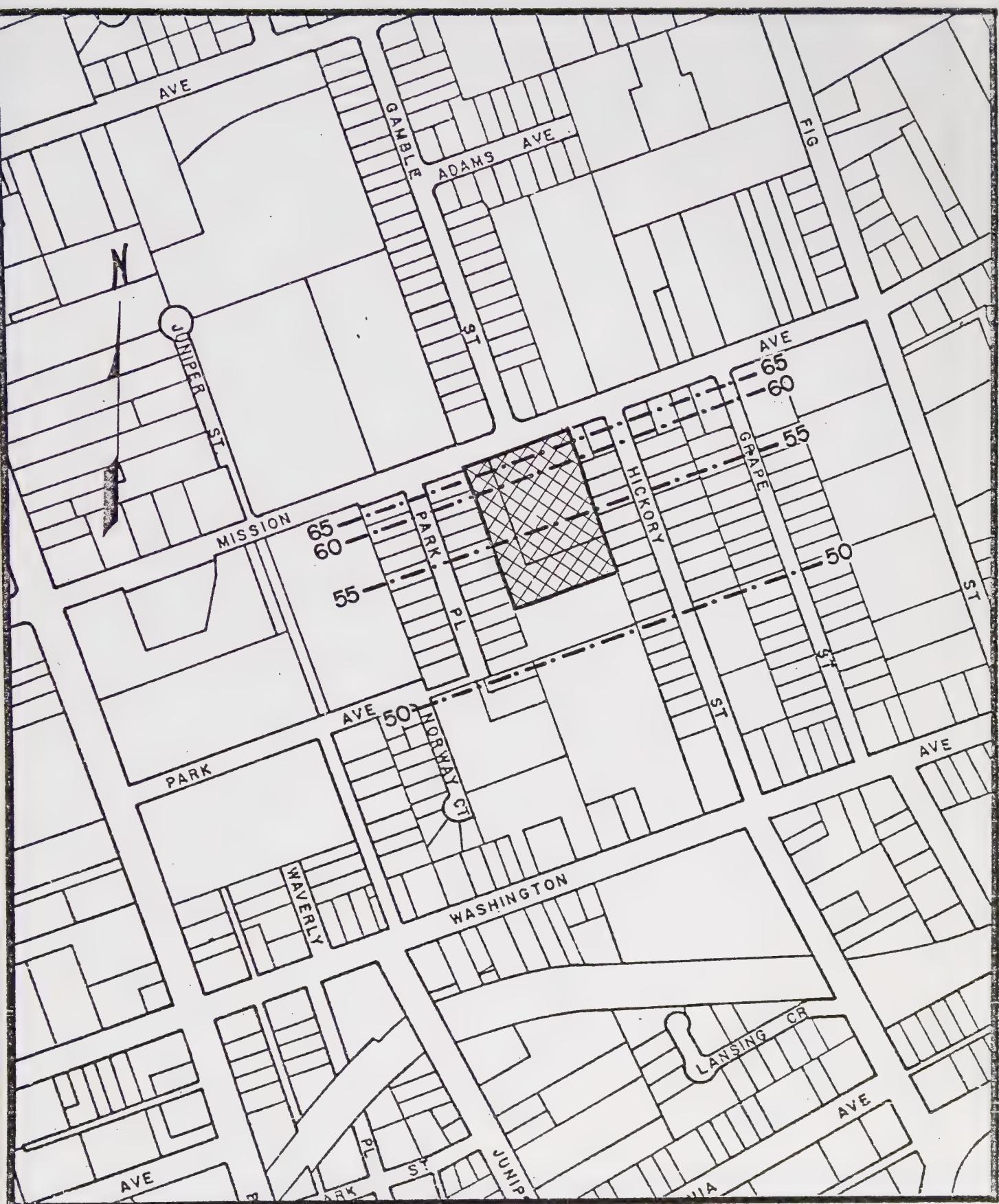


SCALE 1" = 400'

PALOMAR HOSPITAL

1975 TRANSPORTATION NOISE CONTOURS IN dB(A) Ldn

EXHIBIT 2



BEVERLY MANOR CONVALESCENT HOSPITAL
1975 TRANSPORTATION NOISE CONTOURS IN dB(A) Ldn

SCALE 1" = 400'

EXHIBIT 3

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CASA BLANCA CONVALESCENT HOSPITAL

1975 TRANSPORTATION NOISE CONTOURS IN dB(A) Ldn

EXHIBIT 4

SCALE 1" = 400'



CASA DEL DIOS CONVALESCENT HOME
1978 TRANSPORTATION NOISE CONTOURS IN dB(A) Ldn

EXHIBIT 5

SCALE 1" = 400'



CRESTVIEW MANOR

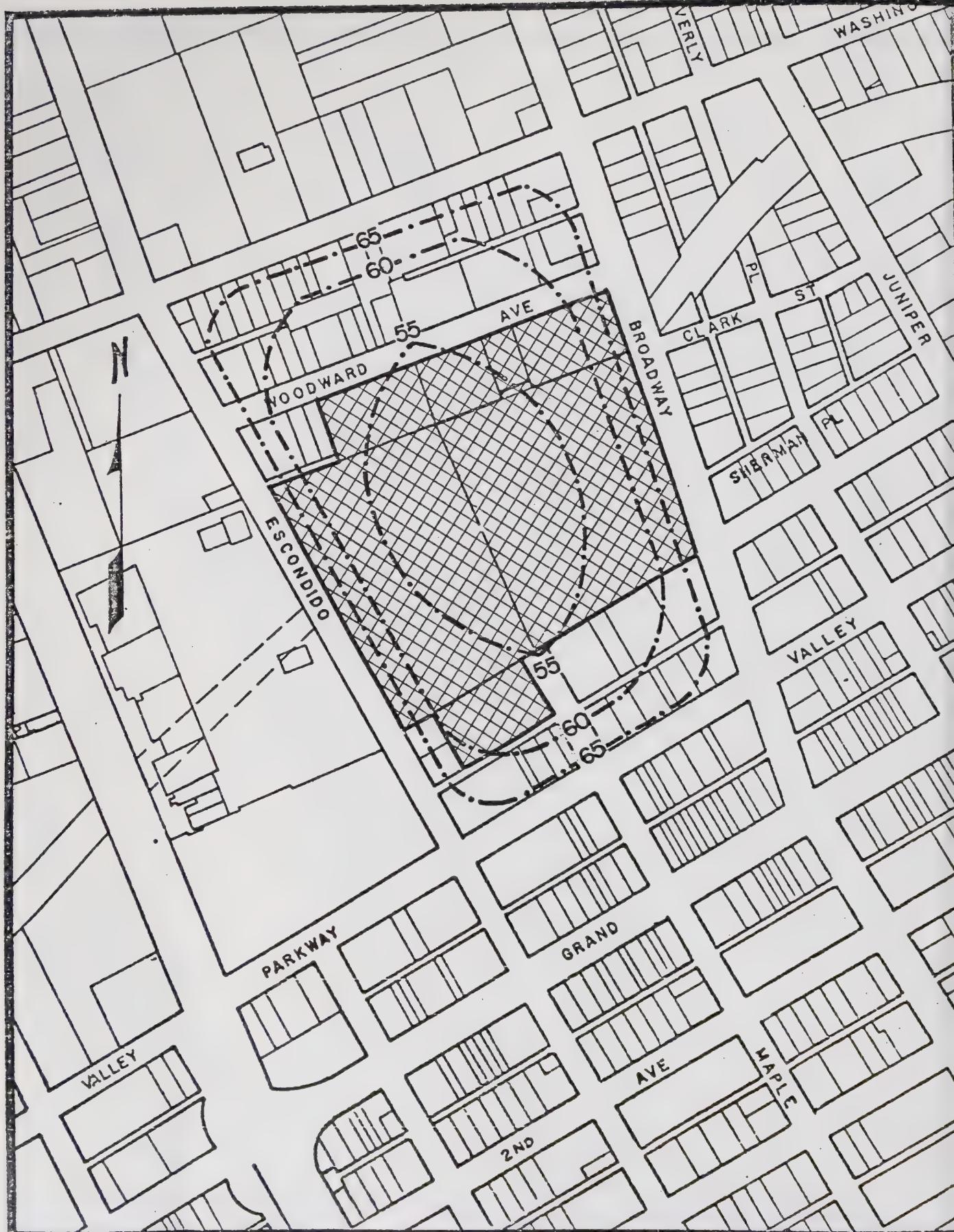
1975 TRANSPORTATION NOISE CONTOURS IN dB(A) Ldn

SCALE 1" = 400'

EXHIBIT 6



HILLTOP CONVALESCENT HOSPITAL
1975 TRANSPORTATION NOISE CONTOURS IN dB(A) Ldn

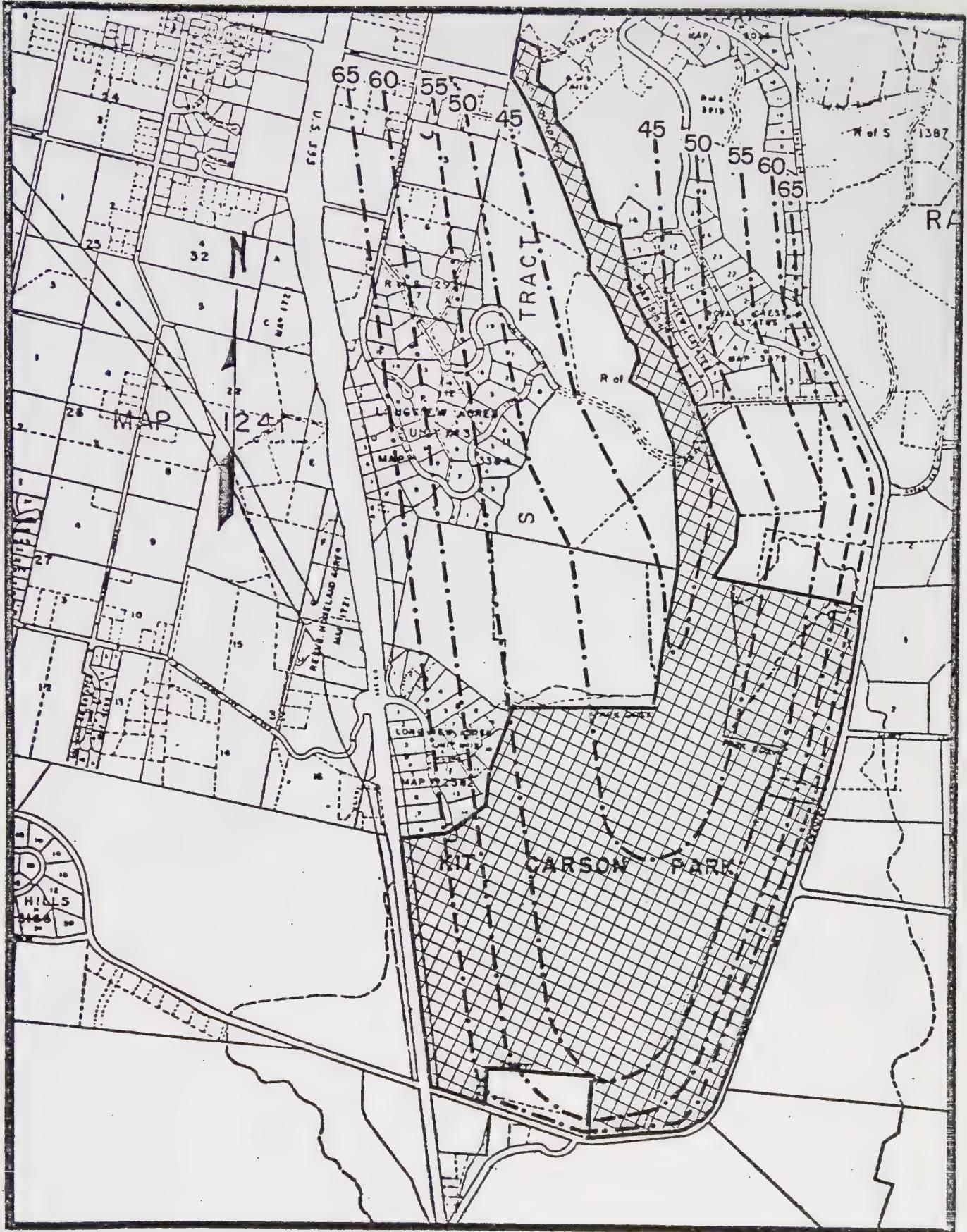


GRAPE DAY PARK

1975 TRANSPORTATION NOISE CONTOURS IN dB(A) Ldn

EXHIBIT 8

SCALE 1" = 400'



KIT CARSON PARK

1975 TRANSPORTATION NOISE CONTOURS IN dB(A) Ldn

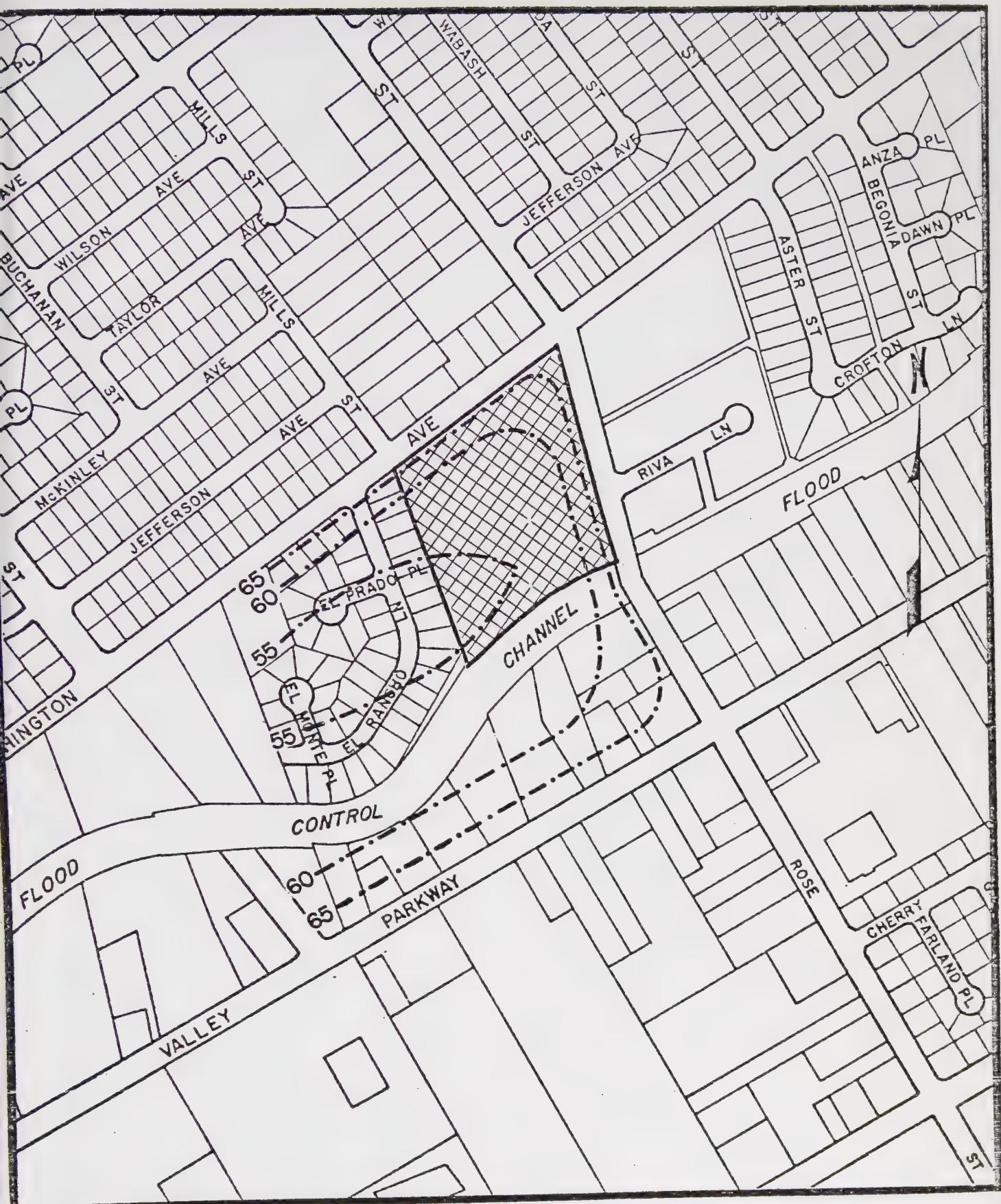
SCALE 1" = 1200'



ROCK SPRINGS PARK

1975 TRANSPORTATION NOISE CONTOURS IN dB(A) Ldn

SCALE 1" = 400'



WASHINGTON PARK
1975 TRANSPORTATION NOISE CONTOURS IN dB(A) Ldn

EXHIBIT 11

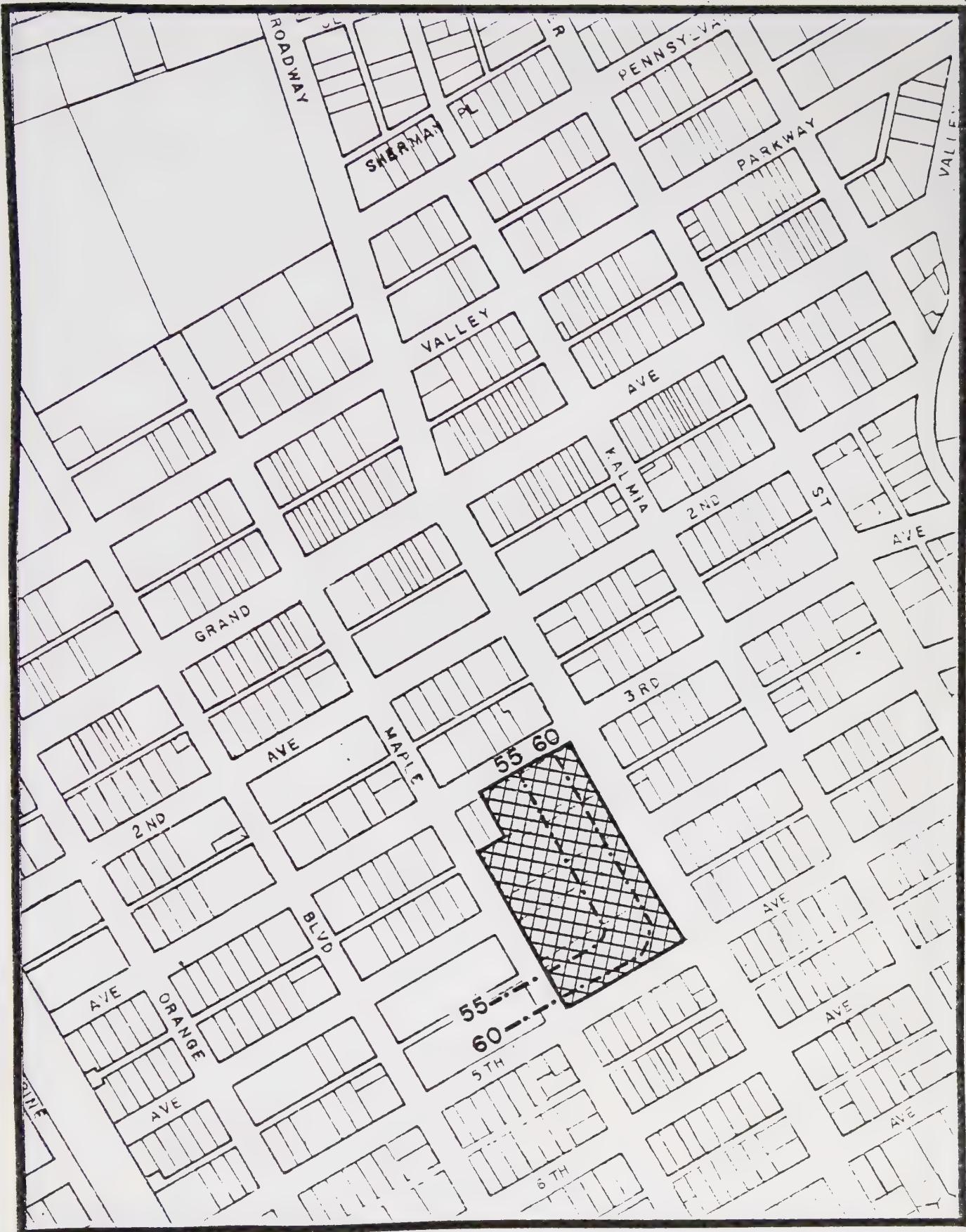
- 70 -



WESTSIDE PARK

1975 TRANSPORTATION NOISE CONTOURS IN dB(A) Ldn
EXHIBIT 12

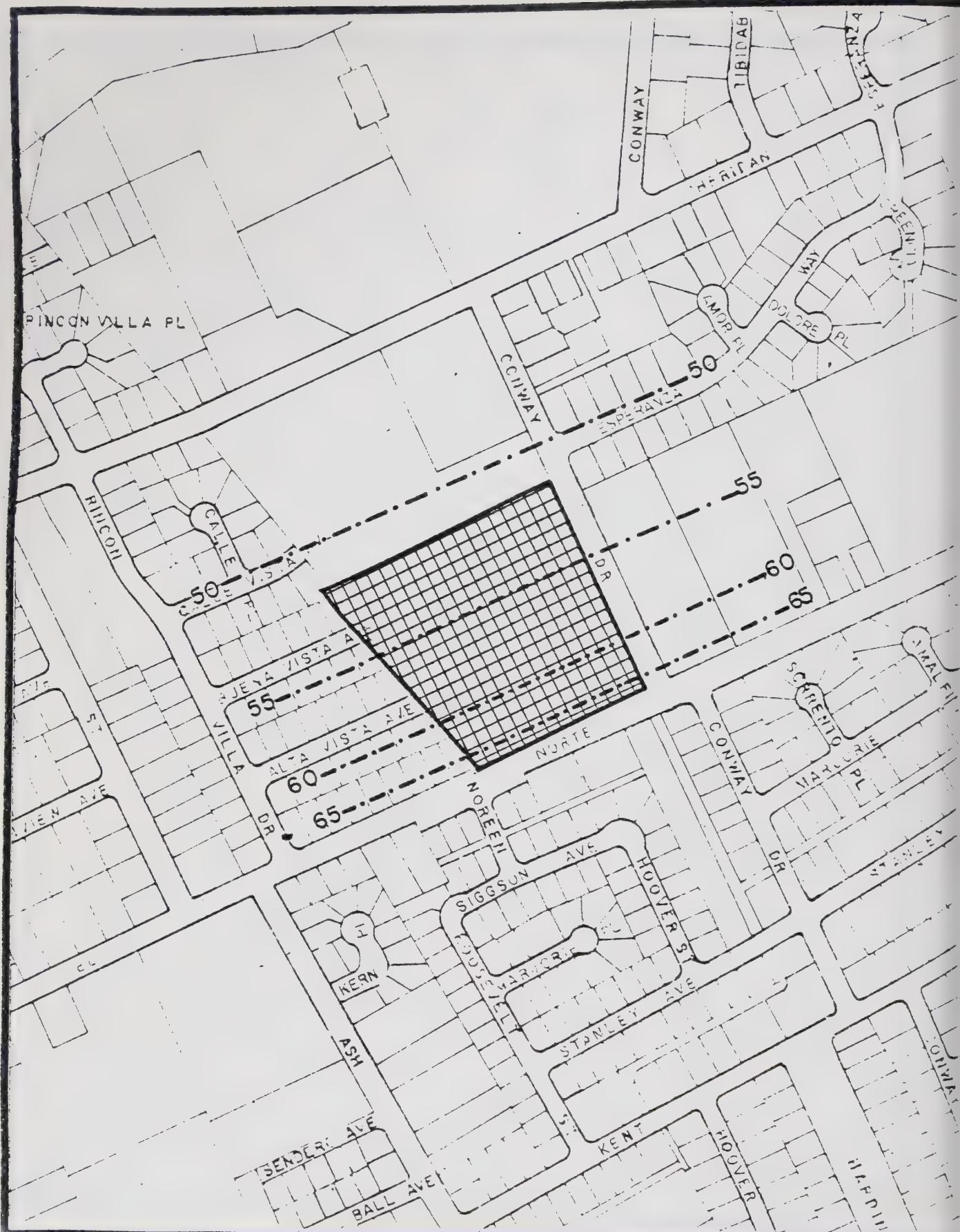
SCALE 1" = 400'



SCALE 1"=400' CENTRAL ELEMENTARY SCHOOL

1975 TRANSPORTATION NOISE CONTOURS IN dB(A) Ldn





SCALE 1"=400'

CONWAY ELEMENTARY SCHOOL

1975 TRANSPORTATION NOISE CONTOURS IN dB(A) Ldn

N

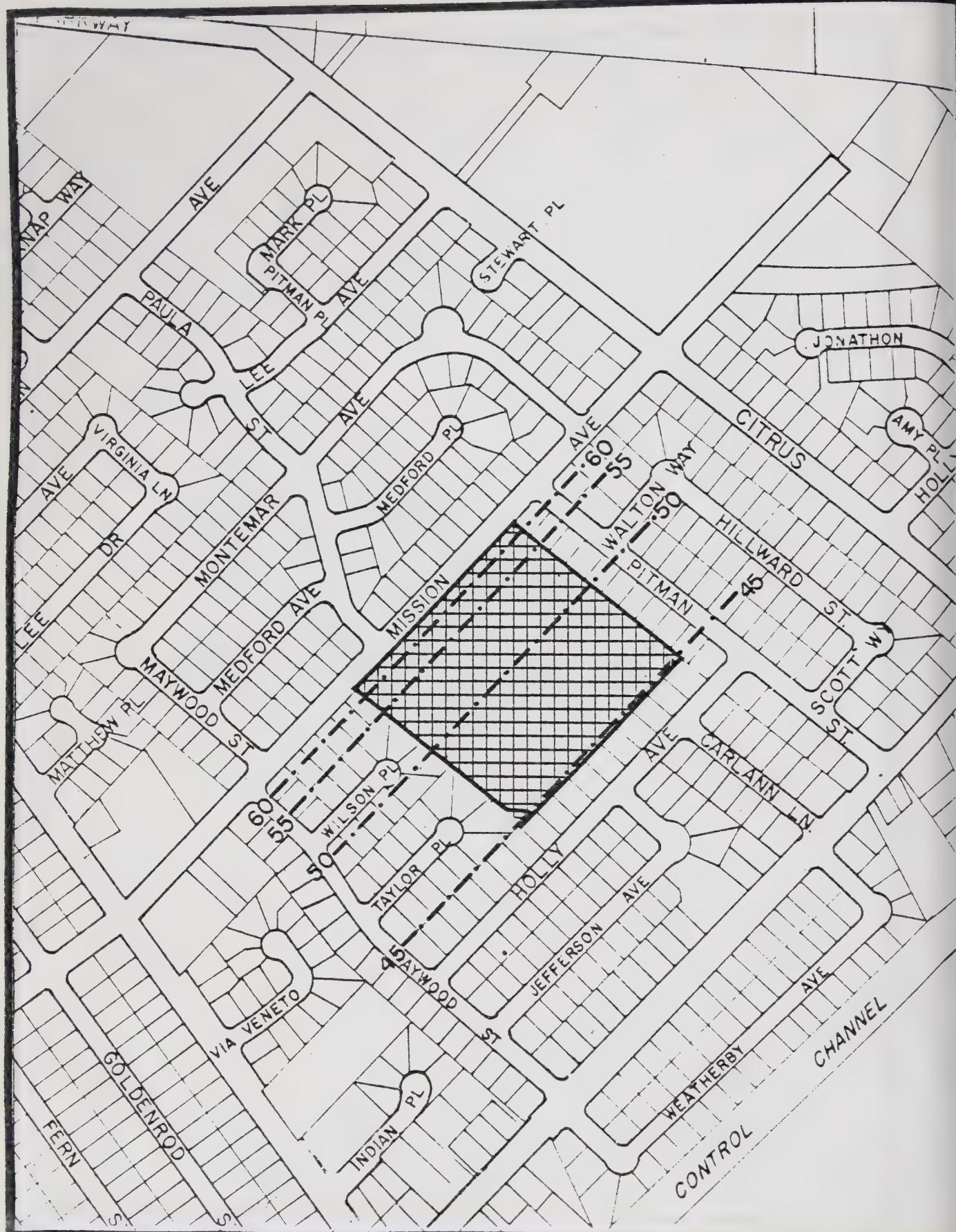


SCALE 1" = 400'

FELICITA ELEMENTARY SCHOOL

1975 TRANSPORTATION NOISE CONTOURS IN dB(A) Ldn

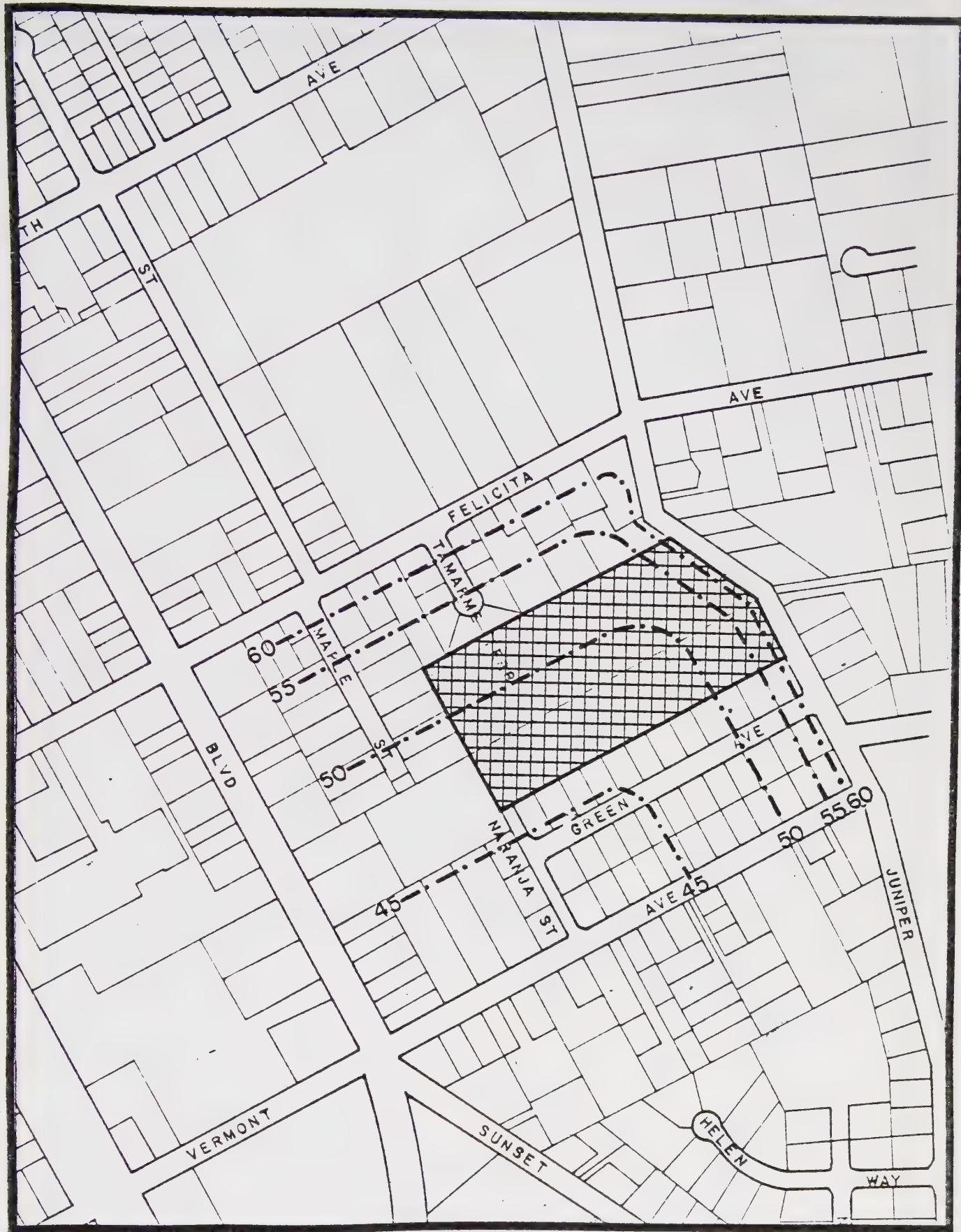
N
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SCALE 1"=400'

GLEN VIEW ELEMENTARY SCHOOL

1975 TRANSPORTATION NOISE CONTOURS IN dB(A) Ldn



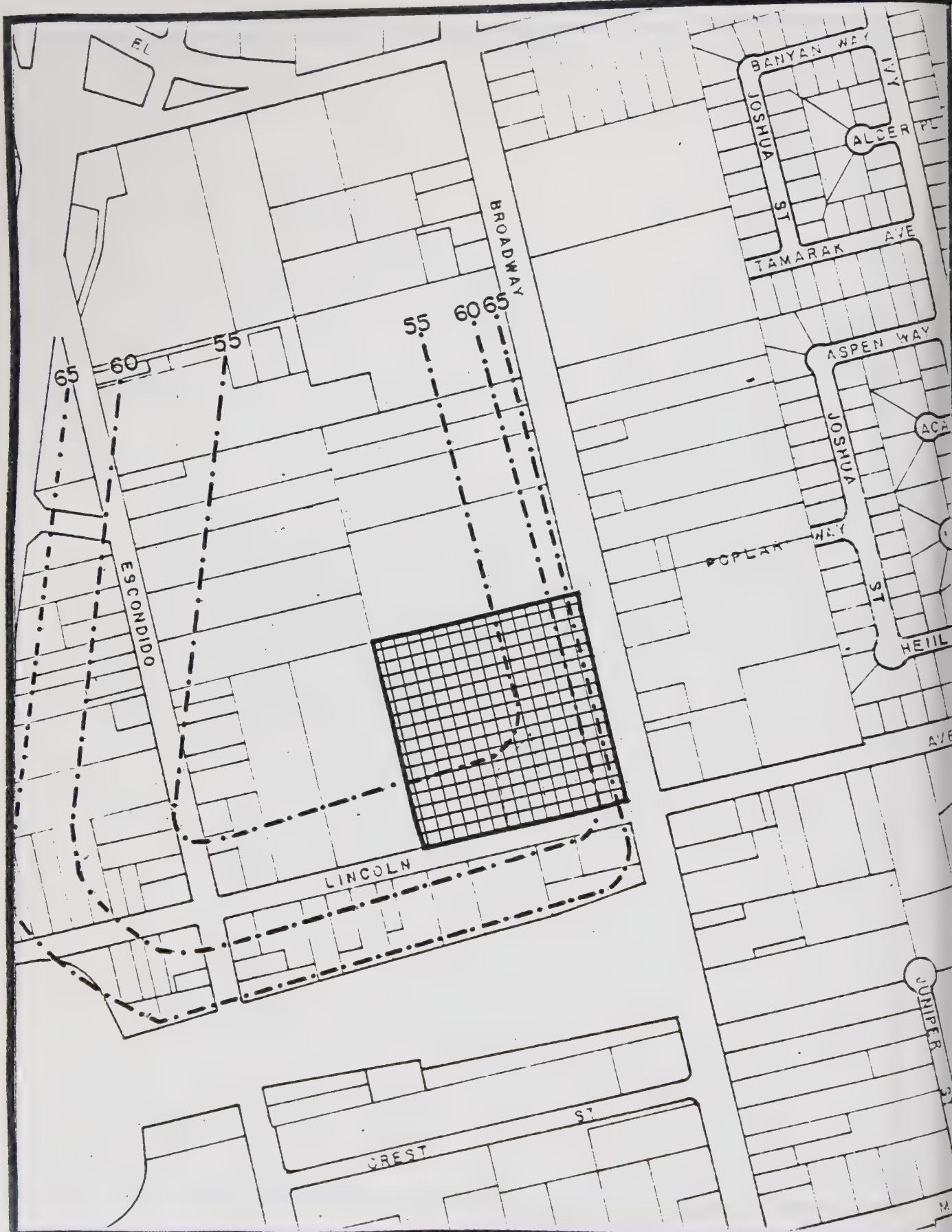
SCALE 1" = 400'

JUNIPER ELEMENTARY SCHOOL

1975 TRANSPORTATION NOISE CONTOURS IN dB(A) Ldn

EXHIBIT 17 - 76 -

N



SCALE 1"=400'

LINCOLN ELEMENTARY SCHOOL

1975 TRANSPORTATION NOISE CONTOURS IN dB(A) Ldn



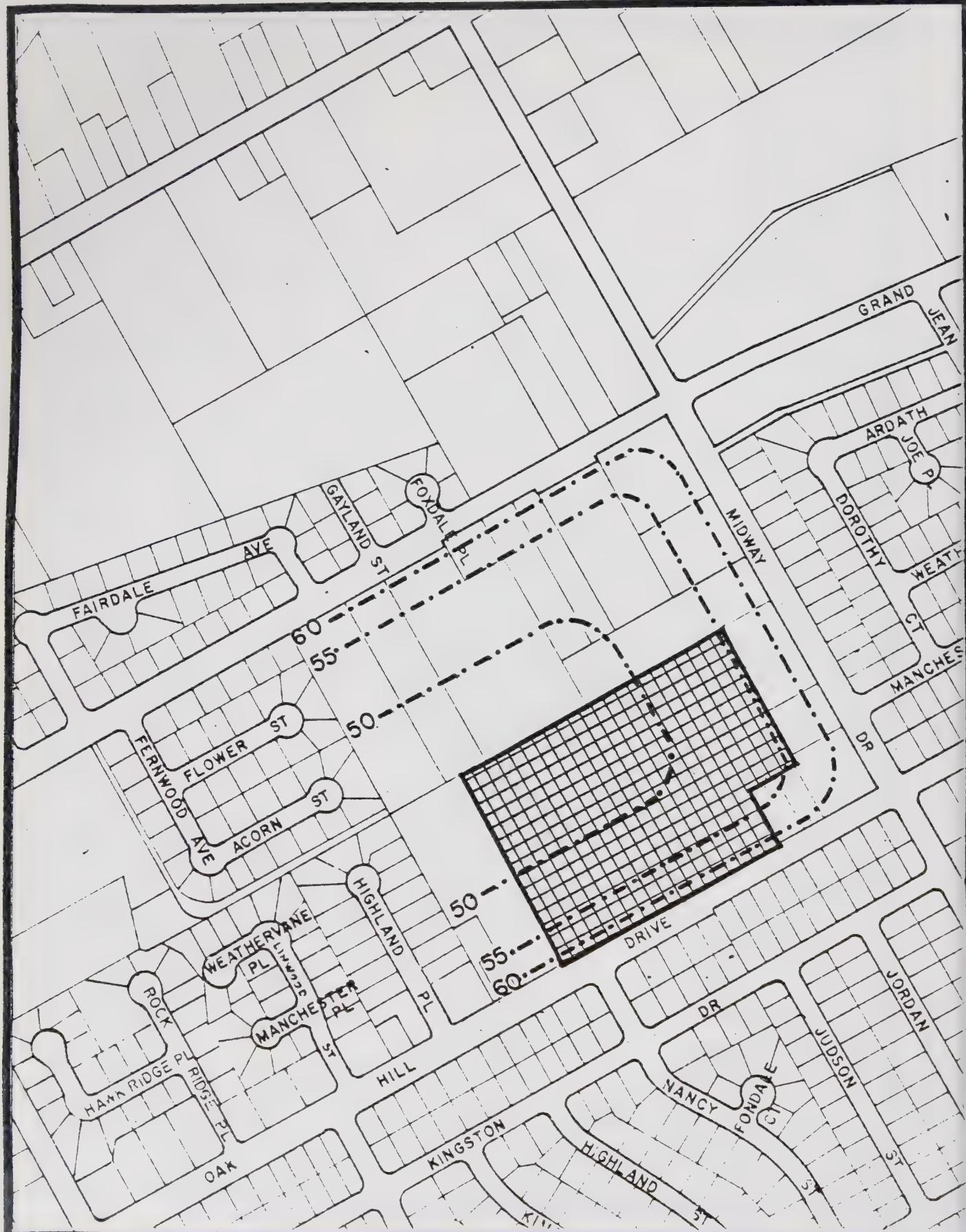
SCALE 1"=400'

MILLER ELEMENTARY SCHOOL

1975 TRANSPORTATION NOISE CONTOURS IN dB(A) Ldn

N



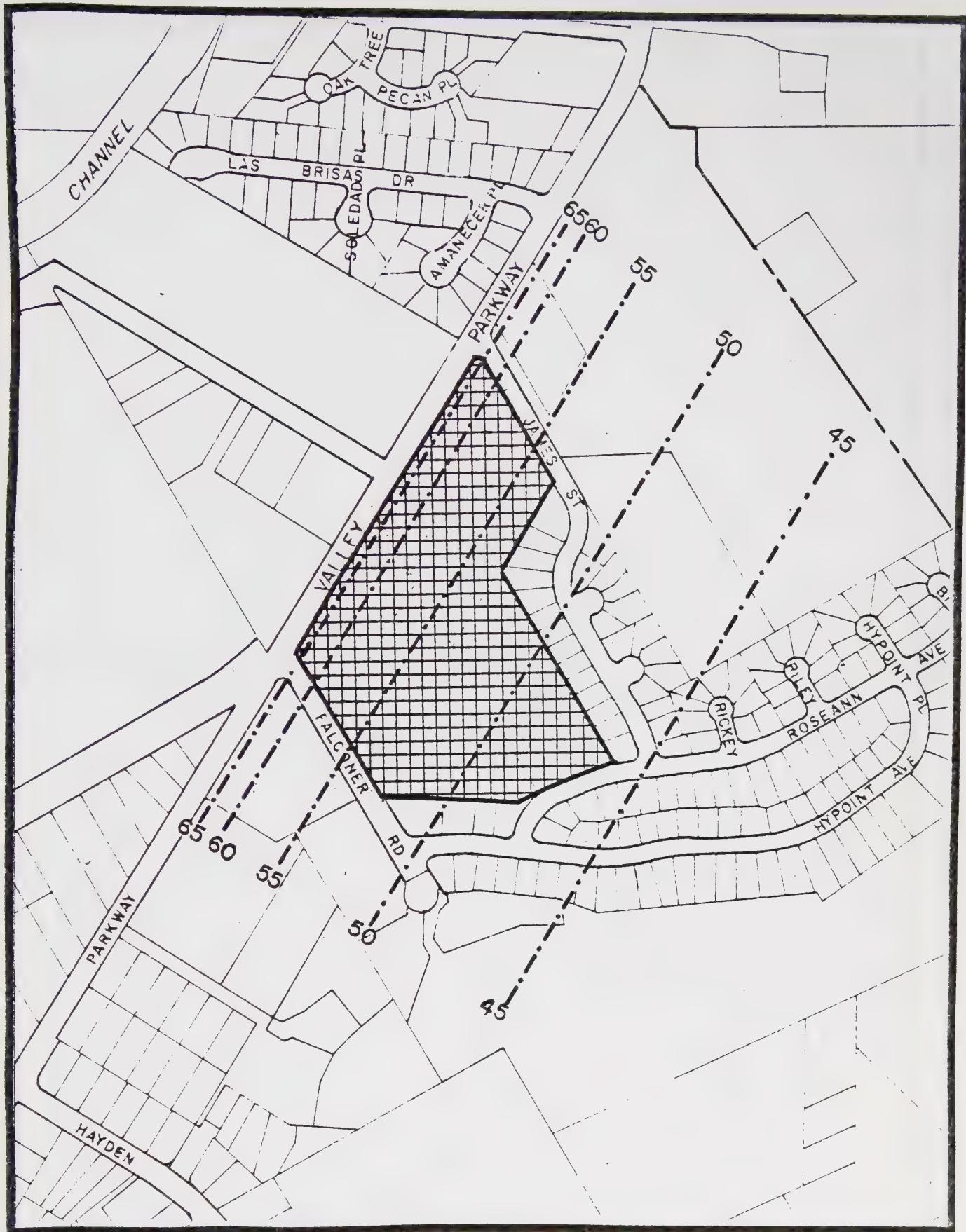


SCALE 1" = 400'

OAK HILL ELEMENTARY SCHOOL

1975 TRANSPORTATION NOISE CONTOURS IN dB(A) Ldn

N
↑



SCALE 1"=400'

ORANGE GLEN ELEMENTARY SCHOOL

1975 TRANSPORTATION NOISE CONTOURS IN dB(A) Ldn

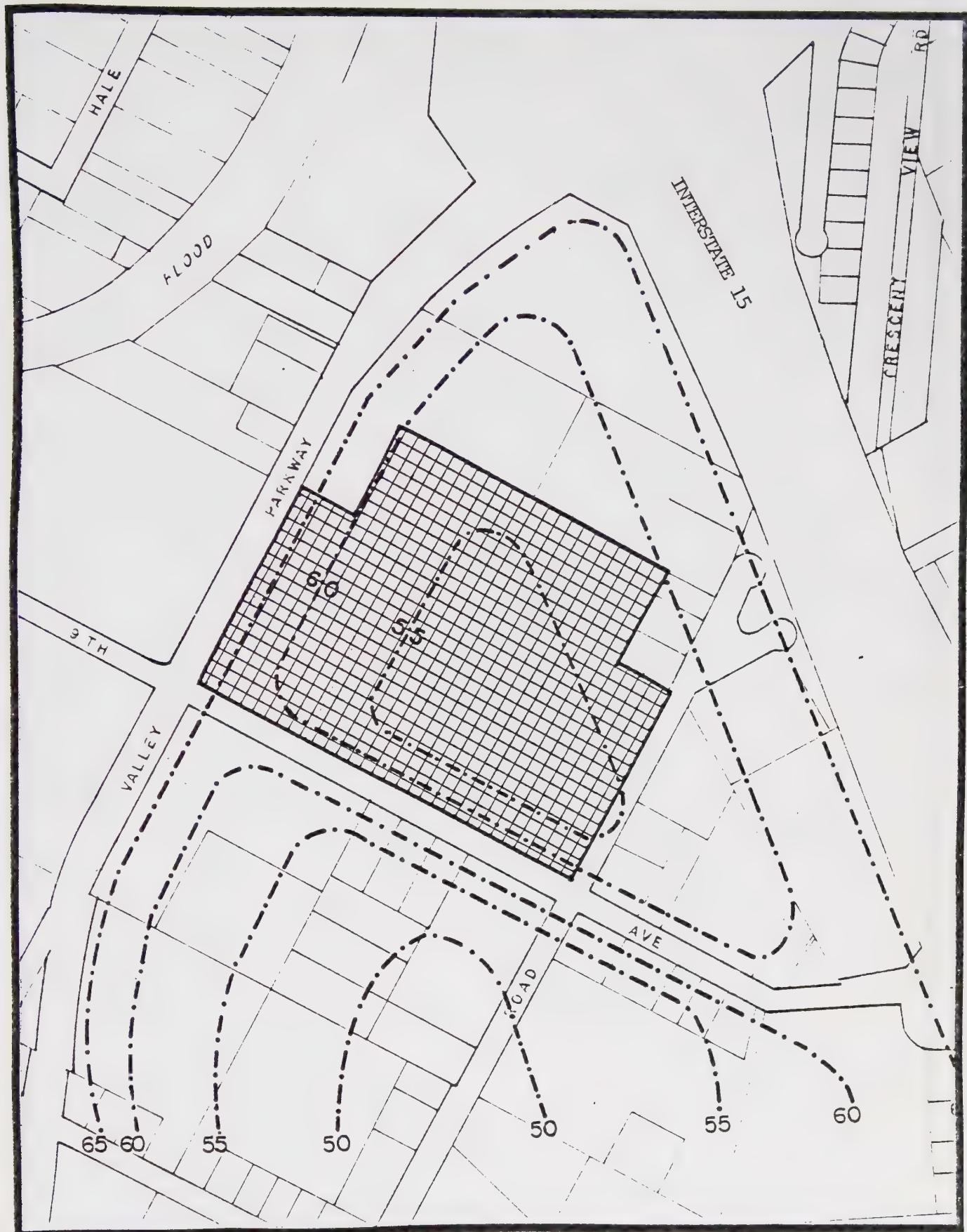




SCALE 1"=400'

ROSE ELEMENTARY SCHOOL

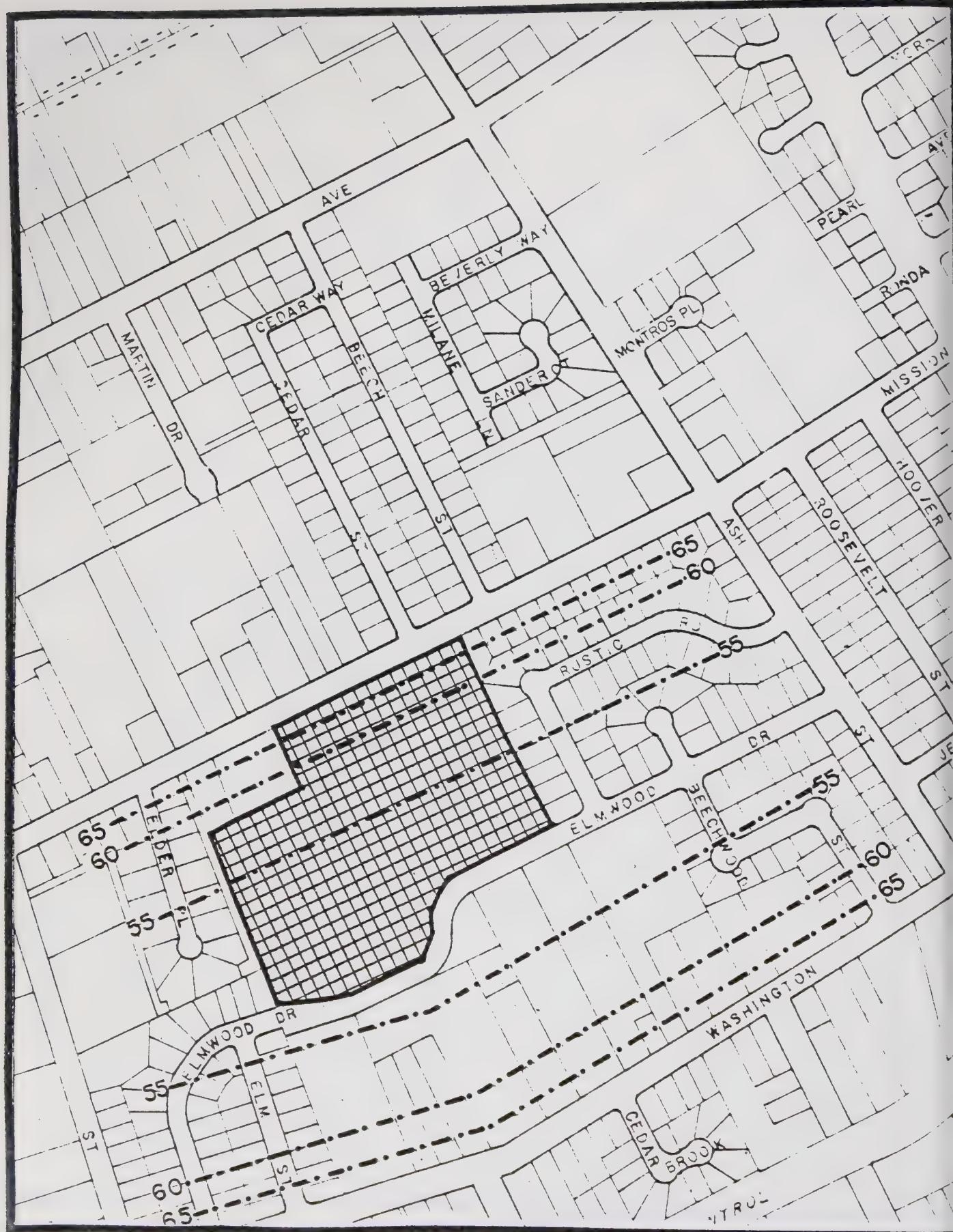
1975 TRANSPORTATION NOISE CONTOURS IN dB(A) Ldn



SCALE 1"=400'

DEL DIOS JUNIOR HIGH SCHOOL

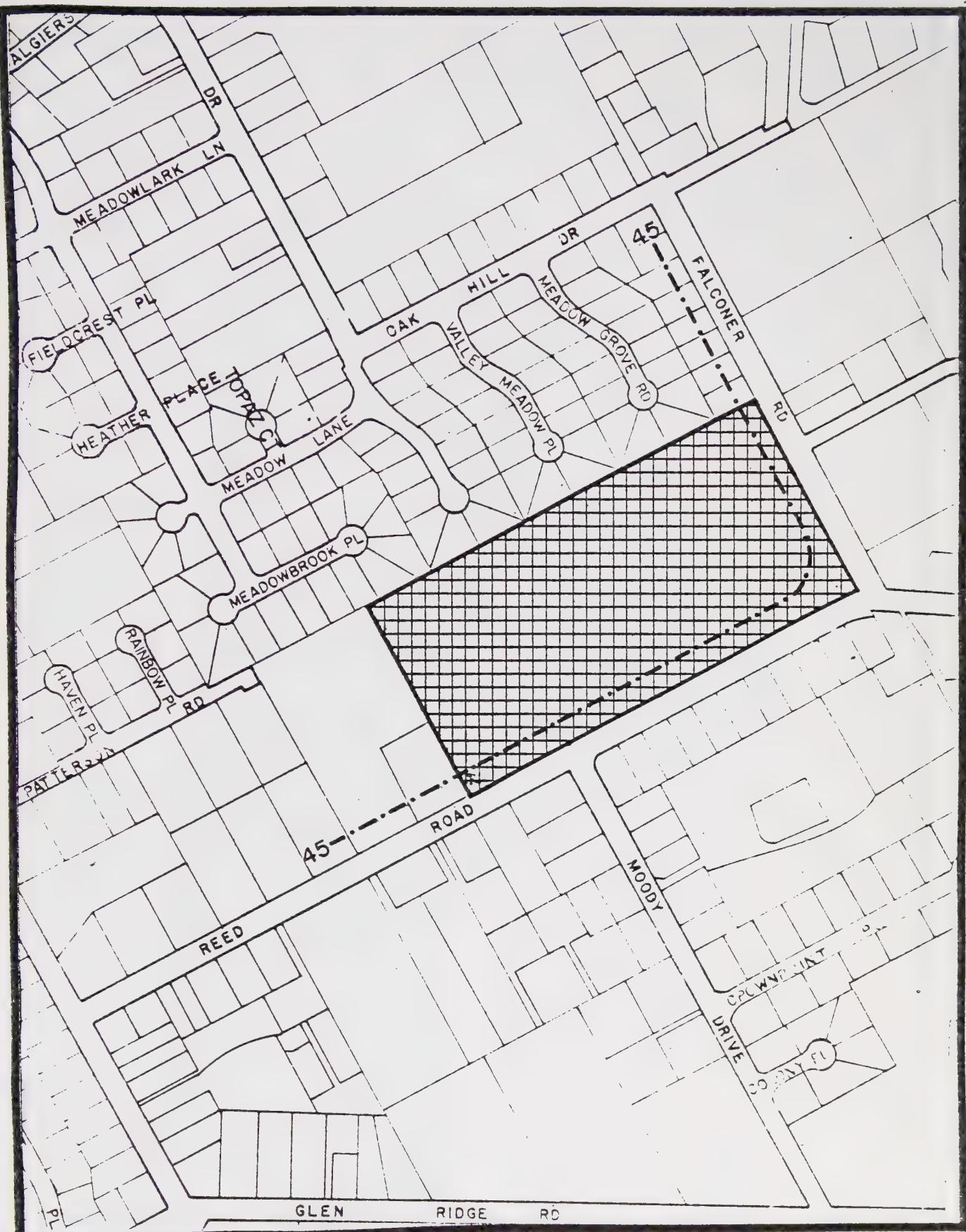
1975 TRANSPORTATION NOISE CONTOURS IN dB(A) Ldn



SCALE 1"=400'

GRANT JUNIOR HIGH SCHOOL

1975 TRANSPORTATION NOISE CONTOURS IN dB(A) Ldn

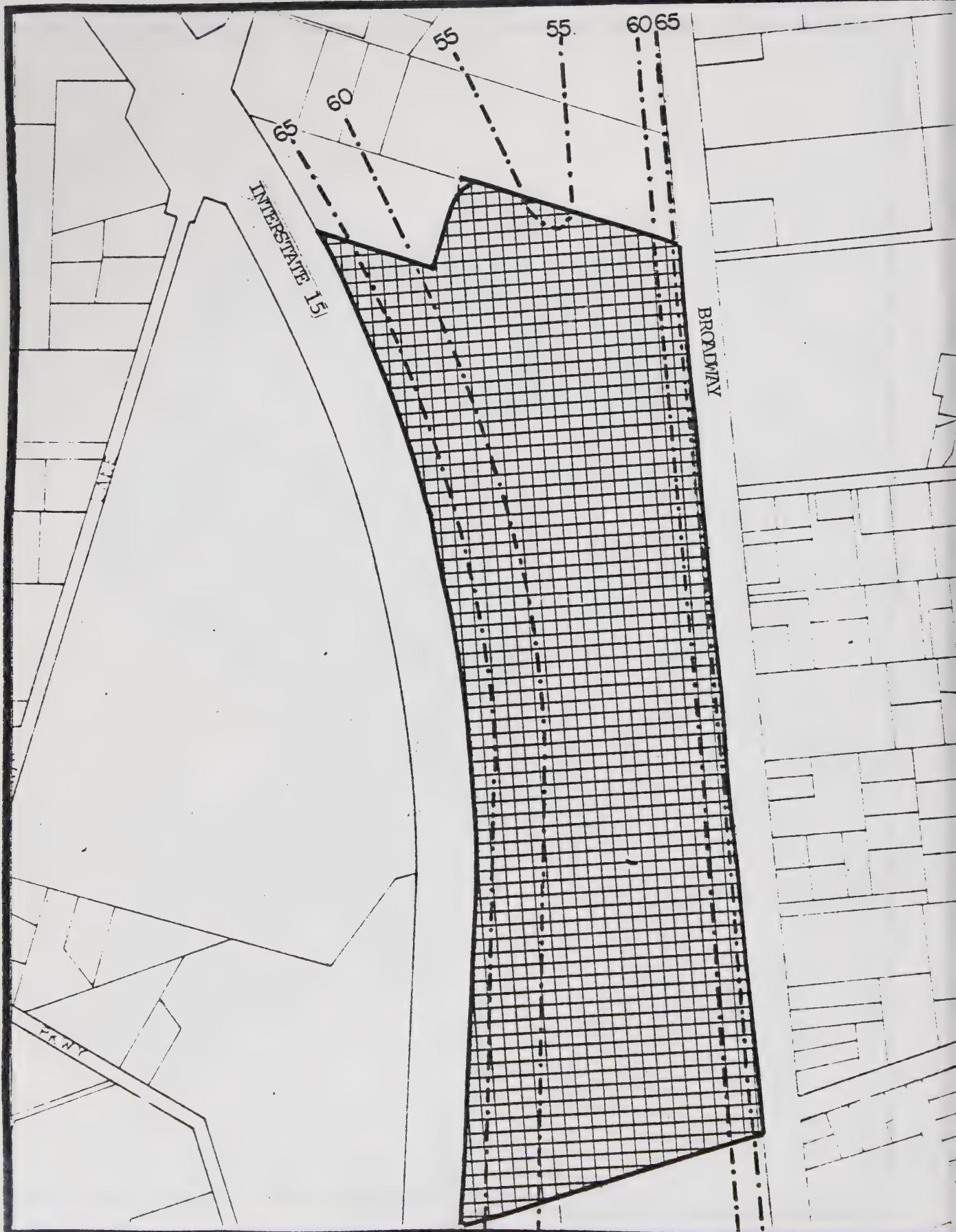


SCALE 1"=400'

HIDDEN VALLEY MIDDLE SCHOOL

1975 TRANSPORTATION NOISE CONTOURS IN dB(A) Ldn

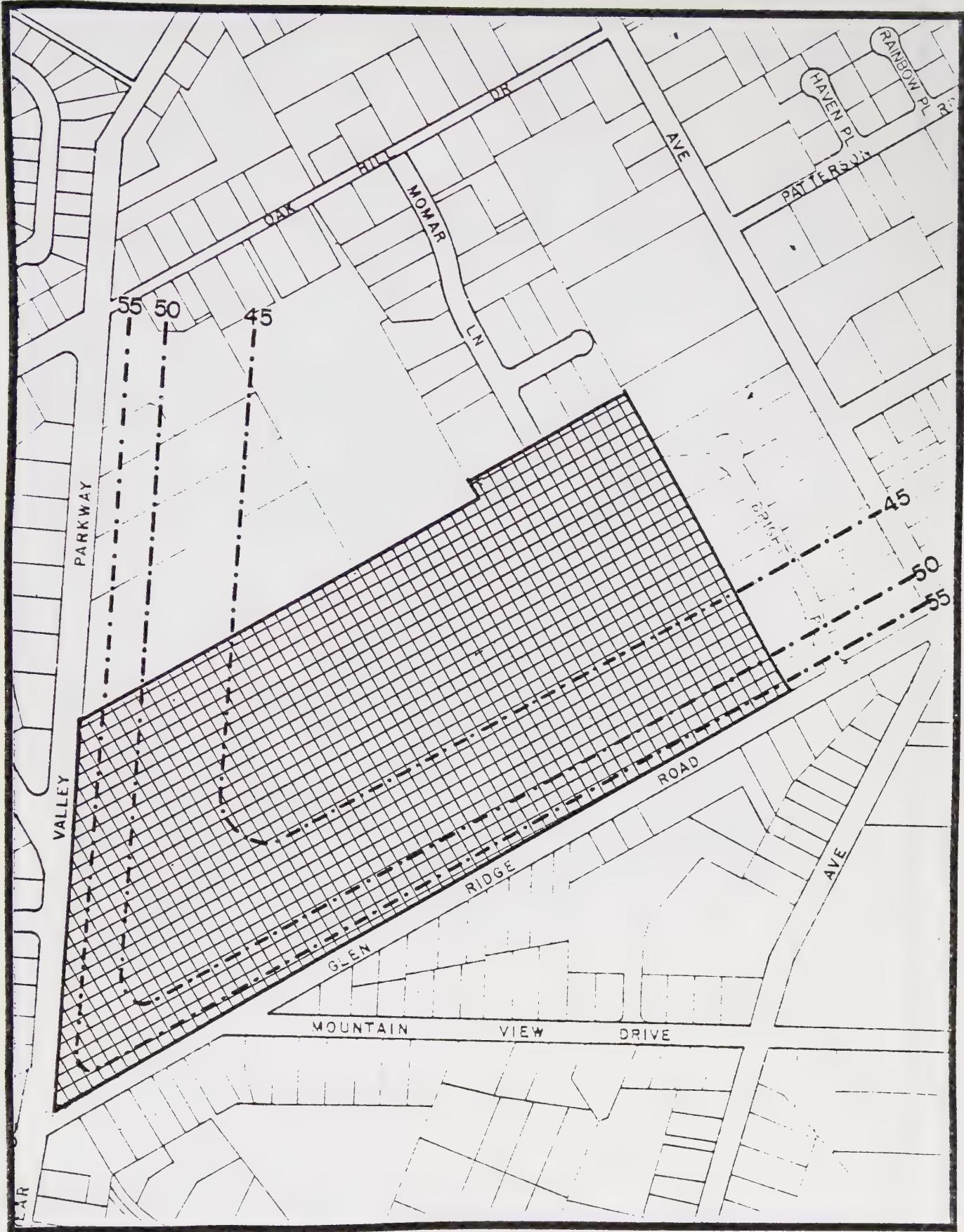




SCALE 1"=400'

ESCONDIDO HIGH SCHOOL

1975 TRANSPORTATION NOISE CONTOURS IN dB(A) Ldn



SCALE 1"=400'

ORANGE GLEN HIGH SCHOOL

1975 TRANSPORTATION NOISE CONTOURS IN dB(A) Ldn





SCALE 1"=400'

SAN PASQUAL HIGH SCHOOL
1975 TRANSPORTATION NOISE CONTOURS IN dB(A) Ldn

GENERAL NOISE SOURCES

The Federal Noise Pollution and Abatement Act of 1970 established an Office of Noise Abatement in the U.S. Environmental Protection Agency (EPA). The Federal Noise Control Act of 1972 provides a comprehensive statement of national noise policy. It requires EPA to publish reports on the subjects of noise criteria, aircraft noise and appropriate noise levels to protect health and welfare. The Noise Control Act requires EPA to prescribe noise emmission regulations for construction equipment, transportation equipment, motors or engines, and electronic equipment. States and local governments may not set different emmission standards but may regulate environmental noise through regulation of the use, operation, or movement of such equipment.

Local jurisdictions may enact noise regulations to secure and promote the public health and welfare as an exercise of their police power. The prohibition of unnecessary, excessive and annoying noises fall within the jurisdiction of the local authority. These may include sources such as horns, drums, animals, fireworks, and record players. A local authority may also place a curfew on construction or other sources that create unnecessary or offensive noise, and may enact standards limiting noise emmissions which cross property lines. The ordinance proposed to implement this Element of the City's General Plan contains a number of such standards.

CONSTRUCTION NOISE

Noise associated with construction projects has become increasingly responsible for discomfort in the human environment. Dozens of construction projects of various types are occurring throughout the City at any given time. In 1977, the Building Inspection Department issued over 1300 permits for structures valued at over \$57 million. As the City grows, citizens are exposed to these noise intrusions with increasing frequency.

The proposed noise ordinance contains regulations which establish limits for construction noise. Additionally, any use of power construction equipment is prohibited between 7 p.m. and 7 a.m. daily and on Sundays and specified holidays. The following table shows allowable construction noise limits from the proposed noise ordinance.

<u>Total Duration in 24 Hours</u>	<u>Decibel Level Allowance</u>	<u>Total Decibel Level</u>
Up to 15 minutes	+15	90
Up to 30 minutes	+12	87
Up to 1 hour	+ 9	84
Up to 2 hours	+ 6	81
Up to 4 hours	+ 3	78
Up to 8 hours	0	75

In the event that lower noise limit standards are established for construction equipment pursuant to State or Federal law, said lower limits shall be used as a basis for revising and amending the noise level limits specified above.

INDUSTRIAL NOISE - Off Site

Escondido contains a large and diversified industrial area. The industrial area is divided into three zones: Light Industrial (M-1), General Industrial (M-2), and Industrial Park (I-P). The M-1 and M-2 zones are approximately 50% developed, while the I-P zone is basically undeveloped. No industrial uses currently exceed Ldn 60 db(A) at adjacent properties.

All of the industrial zones contain scattered non-conforming residences. Most of these are older and in marginal condition. It is anticipated that these will be displaced as further industrial development takes place.

The zoning ordinance contains performance criteria which restrict noise in the industrial zones. Allowable levels for the night time period are 65db(A) for the M-1 and I-P zones and 75db(A) for the M-2 zones. Allowable daytime levels are less than 75db(A) for the M-1 and I-P zones and less than 95db(A) for the M-2 zones. The ordinance allows these limits to be exceeded for not more than five minutes in any hour during the day-evening period. When compared with other jurisdictions, these limits are very high, particularly the 95db(A) limit for the M-2 zone. Although Escondido's industries are relatively quiet, these permissible levels create a potential for disruption of surrounding residential areas. As an example, a 95db(A) noise received from a distance of one-half mile would still represent a noise exposure of 65db(A).

During the General Planning process, the boundaries for the industrial area were established to buffer the area from surrounding noise sensitive uses. In general, the industrial zone boundaries run along ridgelines, the freeway, the flood control channel, or next to commercial areas. Only the industrial area south of Grand Avenue lacks a physical or line-of-sight buffer between it and adjacent residential areas. The buffering concept is an excellent one; however, the aforementioned performance criteria negate the value of the buffering by permitting very disruptive noise levels.

The proposed ordinance contains much stricter noise standards for the industrial zones, based on ordinances common to this area and other sources. In the M-1 and I-P zones the noise level limit for the day-evening period (7 a.m. to 10 p.m.) would be 65db(A) and during the night period (10p.m. to 7 a.m.) the noise level would be 60db(A). In recognition of the more industrially intensive nature of the

M-2 zone the noise level limits are slightly higher than the other industrial zones. The proposed ordinance would limit noise in the M-2 zone during the day period (7 a.m. to 7 p.m.) to 70db(A), and during the evening and night period (7 p.m. to 7 a.m.) noise would be limited to 65db(A). A violation of these proposed limits would not occur until these limits are exceeded by 5db(A) at the property line.

A preliminary survey of noise in the industrial zone indicates that no industries are currently in violation of the proposed ordinance. The loudest industries monitored were sand and gravel companies, grain elevators (while loading corn only), and metal fabrication industries. A sand shaker-sorter on Tulip Street in the M-2 zone produced a peak noise of 71 to 73db(A) at the property line. A grain elevator on Grand Avenue also in the M-2 zone produced noise of 71 to 72db(A) during corn loading operations. Neither of these uses would be in violation of the proposed ordinance.

Future development proposals for the industrial areas would be reviewed to determine noise exposures likely to result from the proposed uses. In cases where the proposed use is likely to cause disruption of surrounding areas, the applicant may be asked to provide an acoustical analysis to show that the proposed use will not exceed the community noise standards previously mentioned. In most cases these procedures should be sufficient to prevent disruption of surrounding areas. However, the industrial area south of Second Avenue will still have some potential to disrupt surrounding residential areas. In this area, M-2 zoning is located across the street from R-2, multiple residential zoning. A legal 74db(A) noise measured at the property line would be received 225 feet away as a 65db(A) noise, and 510 feet away as a 60db(A) noise. Current uses in this area are primarily low intensity industrial uses, such as material storage yards and warehouses, which generate little noise. It is possible that much of this area will be redeveloped to more intensive uses in the future.

In conclusion, noise from Escondido's industries is not excessive, but the performance criteria currently listed in the zoning ordinance allow noise levels which could be highly disruptive. Lower industrial noise level standards, which are not

now exceeded by present industries, are proposed in the new noise ordinance. Methods have been proposed to review and prevent residential disruption from industrial noise in the future.

INDUSTRIAL NOISE - Employee Noise Exposure Standards

Industrial noise levels for employees of industrial areas are regulated by National and State Acts. The Walsh-Healy Public Contracts Act and the National Occupational Safety and Health Act (OSHA) set a maximum allowable exposure time of eight hours for noise levels above 90db(A), a level at which you must shout in order to be heard just two feet away. The allowable levels range up to 115db(A) for 15 minutes in eight hours. The national OSHA is applicable to all businesses which are engaged in interstate commerce, while the Walsh-Healy applies only to firms with federal contracts. The State Department of Industrial Relations through the California Occupational Safety and Health Act of 1972 (OSHA) has adopted the federal standards for all employees in the state. Other than its own employees, the City has no responsibility for compliance or enforcement of these standards.

NUISANCE NOISE

These are several types of disturbances which are associated with everyday activities and increases with the intensity of land use, such as sounds from lawnmowers, air conditioners, radios, and animals that can be classified as nuisance noise.

According to city police officials, the most common disturbing-the-peace complaints are barking dogs, the off-road operation of motor cycles, and use of power tools. Noise complaints are not included on monthly police summaries so the exact number cannot be reported, but there are significant increases in complaints during the summer months due to more outdoor living and open windows. These types of offenses are currently regulated by disturbing-the-peace statutes. It is suggested that they be included in the proposed noise control ordinance.

NOISE CONTROL ORDINANCE/CURRENT REGULATIONS

The nuisance of noise is currently regulated by provisions in the City Code, the Zoning Ordinance, the Uniform Building Code and the many state and federal statutes previously cited. The following is a brief summary of these current local regulations.

City Noise Ordinance

The City's first noise ordinance was adopted in August 1949 and was amended in 1957 to its current state (Sections 17-29 to 17-43 of the Municipal Code). The ordinance is very general in listing offenses as "loud and excessive" and as "disturbing the peace." It does not establish noise standards for different land uses or specify decibel levels for noise violations as required by the State guidelines.

Zoning Ordinance

The zoning ordinance contains performance criteria which restrict industrial noise in the M-1, M-2, and I-P zones. The performance criteria limit noise as shown in the following chart.

	M-1	M-2	I-P
Night 10:00 p.m. to 7:00 a.m.	65db(A)	75db(A)	65db(A)
Day-Evening 7:00 a.m. to 10:00 p.m.	less than 75db(A)	less than 95db(A)	less than 75db(A)
Level which may be exceeded up to 5 minutes any hour during day-evening	75db(A)	95db(A)	75db(A)

Additionally, the performance criteria prohibit "noise which is objectionable to adjacent property owners or tenants." The numerical limits listed are high, relative both to other jurisdictions and to what might be considered objectionable to adjacent owners or tenants.

Building Code Requirements

The Building Department enforces State Noise Insulation Regulations (Calif. Admin. Code Title 25 Chapter 1) which relates to residences including hotels, motels, apartment houses, and dwellings other than detached single family houses. This code requires that in areas where ambient noise levels exceed 60db(A) on the Community Noise Equivalency scale (CNEL), all proposed dwellings must be insulated to reduce the level to 45db (CNEL) indoors. The Building Department has tentatively mapped 60db (CNEL) contour zone as a 1000-foot wide corridor along route 78 and the present Route I-15 expressway. The completion of the new I-15 bypass will cause the addition of new areas where the 60db noise levels are exceeded, however, much of the old I-15 expressway will experience reduced noise levels. Information developed by this element can be used to modify those temporary limits.

The section on Noise Impact Areas shows the location of areas which exceed 60db(A) (Ldn). The Building Inspection Department will enforce insulation code requirements in those areas listed in the noise impact zone section. Enforcement of these standards should be based on the projected 1990 levels in order to ensure that noise levels resulting from or impacting future growth are properly mitigated.

PROPOSED ORDINANCE

To maintain the community noise standards established by this element and to implement the proposals of this element, it is necessary to update the noise control ordinance. Also, for the reasons spelled out in the purpose and intent section of the proposed ordinance, it is necessary to have a comprehensive noise control ordinance.

The proposed ordinance, which follows, is developed from the existing noise control ordinances of the County of San Diego and the City of San Diego, with simplified measurement procedures taken from the California League of Cities Model Noise Ordinance. It is desirable and practical to have compatibility with neighboring jurisdictions so some uniformity of policy, standards, and enforcement can be maintained throughout the region.

The ordinance begins with sections that enumerate the intentions, purpose, sound measurement procedures and pertinent definitions. It then goes on to establish maximum ambient noise levels for the different land use zones, reflecting the proposed city noise standards from earlier in this report. The ambient noise levels are proposed for day, evening, and night periods for residential, commercial and industrial zones.

The single family zone ambient noise levels range from 40 to 50 db(A) while duplex and multifamily zones range from 45 to 60db(A). The proposed ambient level for all commercial districts is from 55 to 60db(A). These are the same levels as permitted by the County and City of San Diego ordinances.

Industrial noise limits are 60 to 65db(A) for the M-1 and I-P zones, and 65 to 70db(A) for the M-2 zone. These represent considerable reductions in allowable industrial noise limits as presently defined by the zoning ordinance; however, it is believed that no existing industries exceed these limits.

Other sections of the ordinance propose regulations for powered model vehicles, refuse trucks, food service trucks, and outdoor loudspeakers. Unnecessary and offensive noises are defined. Twelve criteria for determining whether a violation exists are enumerated. Provisions are included to exempt

emergency work, church bells, and public entertainment or sporting events from the general noise regulations.

Enforcement of the proposed ordinance is divided between the Noise Control Officer and the Police Department. The Police Department would retain responsibility for enforcement of the provisions relating to on and off-road motor vehicles, nuisance noise and disturbing the peace violations. Wherever noise measurements are required, the Police Department would be assisted by the Noise Control Officer.

All other provisions of this code would be enforced by the Noise Control Officer. Violations of these regulations would be prosecuted in the same manner as other misdemeanor violations of the Municipal Code. Nothing in these regulations would prevent the Police or Noise Control Officer from efforts to obtain voluntary compliance by way of warning, notice, or other means.

PERSONS AND AGENCIES CONTACTED

1. Aeronautics Division, Department of Transportation, State of California, Mr. Petty.
2. Atchison, Topeka and Santa Fe Railroad Company, Escondido Office.
3. Mike Aulick, Comprehensive Planning Organization.
4. Barry Brannon, pilot, resident of San Diego County.
5. City of Escondido Building Inspection Department.
6. Capt. Schleigh, Police Department, City of Escondido.
7. Mr. Normal Schell, Noise Control Officer, County of San Diego Health Department.
8. Jim Pike, Division of Industrial Safety, State of California.
9. Ross Ainsworth, former Traffic Engineer, City of Escondido.
10. Phillip Broughton, current Traffic Engineer, City of Escondido.

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P R O P O S E D
N O I S E O R D I N A N C E

APPENDIX A

ORDINANCE NO. 7 -

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF
ESCONDIDO, CALIFORNIA, AMENDED THE CODE OF
ORDINANCES, CITY OF ESCONDIDO, CALIFORNIA, BY
THE AMENDMENT OF CHAPTER 17, ARTICLE II, RELA-
TIVE TO NOISE ABATEMENT AND CONTROL.

NOISE ABATEMENT AND CONTROL

Section PURPOSE AND INTENT. The City Council of the City of Escondido finds and declares that:

- (a) Inadequately controlled noise presents a growing danger to the health and welfare of the residents of the City of Escondido.
- (b) The making and creating of unnecessary, excessive, offensive or unusually loud noises within the jurisdictional limits of the City of Escondido is a condition which has persisted and the level and frequency of occurrence of such noises continue to increase;
- (c) The making, creation or continuance of such excessive noises which are prolonged or unusual in their time, place, and use, affect and are a detriment to the public health, comfort, convenience, safety, welfare, and prosperity of the residents of the City of Escondido.
- (d) Every person is entitled to an environment in which noise is not detrimental to his or her life, health, and enjoyment of property; and
- (e) The necessity in the public interest for the provisions and prohibitions hereinafter contained and enacted is declared to be a matter of legislative determination and public policy and it is further declared that the provisions and prohibitions hereinafter contained and enacted are in pursuance of and for the purpose of securing and promoting the public health, comfort, convenience, safety, welfare, prosperity, peace and quiet of the City of Escondido and its inhabitants.

Section 36.402. DEFINITIONS. Whenever the following words and phrases are used in this chapter, unless otherwise defined herein, they shall have the meaning ascribed to them in this section:

- (a) Aircraft shall mean any powered vehicle which at any time of its operation is airborne, and is used to transport people or materials for whatever purpose, and also during ground testing.
- (b) Ambient Noise shall mean all-encompassing noise associated with a given environment, being usually a composite of sounds from many sources near and far. For a comparison of ambient noise with sounds from an identifiable source, at a location and time of day selected for the comparison, the ambient noise level is the sound level mean-square averaged over a period of

fifteen minutes without inclusion of the sounds from the identifiable source and randomly occurring intermittent noises from any other isolated identifiable source.

(c) Commercial Purpose shall mean and include the use, operation or maintenance of any sound amplifying equipment for the purpose of advertising any business, or any goods, or any services, or for the purpose of attracting the attention of the public to, or advertising for, or soliciting patronage or customers to or for any performance, show, entertainment, exhibition, or event, or for the purpose of demonstrating such sound equipment.

(d) Construction Equipment shall mean any tools, machinery or equipment used in connection with construction operations including all types of "special construction" equipment as defined in the pertinent sections of the California Vehicle Code when used in the construction process on any construction site, regardless of whether such construction site be located on-highway or off-highway.

(e) Container shall mean any receptacle, regardless of contents, manufactured from wood, metal, plastic, paper, or any other material including but not limited to any barrel, basket, box, crate, tub, bottle, can or refuse containers.

(f) Decibel shall mean one tenth of a bel and is a unit measure of sound (noise) pressure level. The sound pressure level (expressed in decibels) of a given sound is determined as 20 times a logarithm to the base of 10 of the ratio of the pressure in micro-newtons per square meter of the sound being measured to the standard reference sound pressure of (20) micro-newtons per square meter.

(g) Emergency Work shall mean work made necessary to restore property to a safe condition following a public calamity or work required to protect persons or property from imminent exposure to danger or damage or work by public or private utilities when restoring utility service.

(h) Fixed Source shall mean a machine or device capable of creating a noise level at the property upon which it is regularly located including but not limited to: Industrial and commercial process machinery and equipment, pumps, fans, air-conditioning apparatus or refrigeration machines.

(i) Motor Vehicles shall mean any and all self-propelled vehicles as defined in the California Vehicle Code and shall specifically include, but not be limited to, "mini-bikes" and "go-carts".

(j) Noise Control Officer shall mean a person appointed or designated by the City Council to implement provisions of this ordinance.

(k) Noise Level shall mean "sound level" and the terms may be used interchangeably herein.

(l) Noncommercial Purpose shall mean the use, operation, or maintenance of any sound equipment for other than a "commercial purpose". Noncommercial purpose shall mean and include, but shall not be limited to, philanthropic, political, patriotic, and charitable purposes.

(m) Nonstationary Source shall mean a machine or device capable of being moved from place to place for occasional or temporary use at a given location, including but not limited to powered and manual construction equipment not used in connection with construction operations, powered lawn mowers, chain saws and soil tillers, but excluding motor vehicles.

(n) Person shall mean a person, firm, association, copartnership, joint venture, corporation, or any entity, public or private.

(o) Powered Model Vehicles shall mean, but shall not be limited to air-borne, waterborne, or landborne vehicles such as model airplanes, model boats, and model vehicles of any type or size which are not designed for carrying persons or property and which can be propelled in any form other than manpower or windpower.

(p) Sound Amplifying Equipment shall mean any machine or device, mobile or stationary used to amplify music, the human voice, or any sound.

(q) Sound Level (noise level) shall mean in decibels the quantity measured using the frequency weighting-A of a sound level meter as defined herein.

(r) Sound Level Meter shall mean an instrument for the measurement of sound, including a microphone, an amplifier, an attenuator, networks at least for the standardized frequency weighting-A, and an indicating instrument having at least the standardized dynamic characteristic "fast", as specified in American National Standard Specifications for Sound Level Meters S1.4-1971 or the latest revision thereof.

(s) Sound Truck shall mean any motor vehicle or other vehicle regardless of motive power whether in motion or stationary having mounted thereon, built-in, or attached thereto any sound amplifying equipment other than a car radio or television.

(t) Unnecessary, Excessive or Offensive Noise shall mean:

(1) any sound or noise which constitutes a nuisance involving discomfort or annoyance to any person of normal sensitivity residing in the area.

(2) any sound or noise conflicting with the criteria, standards, or levels as set forth in this chapter for permissible noises.

(3) any sound or noise conflicting with criteria standards or levels established by Federal or State Government which are applicable to the City.

(u) Supplementary Definitions of Technical Terms—definitions of technical terms not defined herein shall be obtained from the American National Standard, "Acoustical Terminology" S1.1-1961 (R-1971) or the latest revision thereof.

Section 11. SOUND LEVEL MEASUREMENT.

(a) Any sound or noise level measurement made pursuant to the provisions of this ordinance shall be measured with a sound level meter using the A-weighting and "slow" response pursuant to applicable manufacturer's instructions, except that for sounds of a duration of two seconds or less, the "fast" response shall be used and the average level during the occurrence of the sound reported.

(b) The sound level meter shall be appropriately calibrated and adjusted as necessary by means of an acoustical calibrator of the coupler-type to assure meter accuracy within the tolerances set forth in American National Standards ANSI-S1.4-1971.

(c) For outside measurements, the microphone shall be not less than four feet above the ground, at least four feet distant from walls or other large reflecting surfaces and shall be protected from the effects of wind noises by the

use of appropriate wind screens. In cases when the microphone must be located within ten feet of walls or similar large reflecting surfaces, the actual measured distances and orientation of sources, microphone and reflecting surfaces shall be noted and recorded. In no case shall a noise measurement be taken within five feet of the noise source.

(d) For inside measurements, the microphone shall be at least three feet distant from any wall, ceiling or partition, and the average measurement of at least three microphone positions throughout the room shall be determined.

(e) The measurement of sound levels shall be expressed as the measured sound level averaged for a period of fifteen minutes, without inclusion of random sounds occurring intermittently and other isolated identifiable sounds, provided, however, that for periods less than fifteen minutes, the measurement of sound levels shall be expressed as the measured sound level mean-square averaged for that period of duration of the sound, without inclusion of random sounds occurring intermittently and other isolated identifiable sounds.

Section FIXED AND NONSTATIONARY SOURCES. On or after _____, unless a variance has been applied for and granted pursuant to this chapter, it shall be unlawful for any person to operate or cause to be operated any single or combination of fixed source or nonstationary source type of equipment or machinery, except construction equipment used in connection with construction operations that individually or collectively constitutes an identifiable sound source, in such a manner as to cause the sound level at any point on the property line of any property to exceed by five decibels the noise level limits set forth in subdivision (a) below plus the noise level limits set forth in subdivision (b) of this section.

(a) Zone Ambient Noise Level Limits. "Noise level limit" or "sound level limit" referred to in this section shall mean that noise level limit as determined from the table below:

LAND USE CATEGORY	ZONE	TIME	SOUND LEVEL db(A)
Single Family Residential	R-A, R-E, R-1, R-T	7 a.m. to 7 p.m. 7 p.m. to 10 p.m. 10 p.m. to 7 a.m.	50 45 40
Duplex	R-2	7 a.m. to 7 p.m. 7 p.m. to 10 p.m. 10 p.m. to 7 a.m.	55 50 45
Multiple Family Residential	R-3, R-4	7 a.m. to 7 p.m. 7 p.m. to 10 p.m. 10 p.m. to 7 a.m.	60 55 50
Commercial & Professional	All	7 a.m. to 7 p.m. 7 p.m. to 10 p.m. 10 p.m. to 7 a.m.	60 55 55
Industrial	M-1, I-P,	7 a.m. to 10 p.m. 10 p.m. to 7 a.m.	65 60
	M-2	7 a.m. to 7 p.m. 7 p.m. to 7 a.m.	70 65

If a measurement location is on a boundary between two zoning districts, the noise level limit for the more restrictive zone shall apply, except in respect to noises emanating from natural resource extractive industries, including, but not limited to, borrow pits and mines. The noise level limit applicable to extractive industries shall be the noise level limit applicable to the M-2 Industrial Zone regardless of the zone in which the extractive industry is actually located.

(b) Time Duration Correction Table. The time duration allowances set forth in the table below shall apply to those noise level limits set forth in subsection (a) above.

Allowances for Sound levels lasting less than an hour:

(1) Add one and only one of the following corrections for time duration:

- Noise persists for more than five minutes out of any one hour.	0
- Noise persists for more than one minute but not more than five minutes out of any one hour.	-5
- Noise persists for one minute or less out of any one hour.	-10

(2) Add one and only one of the following corrections for unusual character:

- Noise has no unusual character	0
- Noise contains a piercing pure tone.	+5
- Noise is impulsive or rattling in nature.	+5
- Noise carries speech, music, or other information content.	+5

Permissible construction noise level limits shall be governed by Section _____ of this chapter.

Section . MOTOR VEHICLES.

(a) Repairs of Motor Vehicles. It shall be unlawful for any person within the City to repair, rebuild, or test any motor vehicle in such a manner as to cause unnecessary, excessive, or offensive noises.

(b) On-Highway. Violations for exceeding applicable noise level limits as to persons operating motor vehicles on a public street or highway in the City shall be prosecuted under applicable California Vehicle Code Provisions and under Federal Regulation adopted pursuant to 42 U.S.C. 4905 (a) (1) (A) (B) and (C) (ii),(iii) for which enforcement responsibility is delegated to local governmental agencies.

(c) Off-Highway. Except as otherwise provided for in this ordinance, it shall be unlawful to operate any motor vehicle of any type on any site other than on a public street or highway as defined in the California Vehicle Code in a manner so as to cause noise in excess of:

(1) those noise levels permitted for On-Highway motor vehicles as specified in the table "35 miles per hour or less speed limits" contained in Section 23130 of the California Vehicle Code and as corrected for distances set forth below:

CORRECTIONS

<u>Distance (feet)</u>	<u>Correction (decibels)</u>
25	-6
28	-5
32	-4
35	-3
40	-2
45	-1
50 (Preferred Distance)	0
56	+1
63	+2
70	+3
80	+4
90	+5
100	+6

A measured noise level thus calibrated to the lane-to-microphone distance of fifty feet shall be deemed in violation of this section if it exceeds the applicable noise level limit specified by this section.

(2) or in excess of those sound levels permitted in Section _____.

(d) Emergency Vehicles. Nothing in this section shall apply to authorized vehicles when being used in emergency situations.

(e) Urban Transit Buses. Buses as defined in the California Vehicle Code shall at all times comply with the requirements of this section.

Section . POWERED MODEL VEHICLES. It shall be unlawful for any person to operate any powered model vehicle except between the hours of 7 a.m. and 9 p.m. and then only in such a manner so as not to emit noise in excess of those levels set forth in Section ; however, if powered motor vehicles are operated in public parks at a point more than 100 feet from the property line, the noise level shall be determined at a distance of 100 feet from the noise source instead of at the property line, and noises from powered model vehicles measured at that distance in excess of the noise limits specified in Section are prohibited.

Section . REFUSE VEHICLES. No person shall operate, or permit to be operated, a refuse compacting, processing, or collection vehicle subsequent to the adoption of this ordinance within the City which when compacting creates a sound level in excess of eighty-six decibels when measured at a distance of fifty feet from any point of the compacting vehicle unless a variance has been

applied for and granted pursuant to this chapter. Notwithstanding the above, on or after one year from the effective date of this ordinance, no person shall operate, or permit to be operated, a refuse compacting, processing, or collection vehicle which when compacting creates a sound level in excess of eighty decibels when measured at a distance of fifty feet from any point of the compacting vehicle.

Section . CONSTRUCTION EQUIPMENT. On or after one year from the effective date of this ordinance, except for emergency work, it shall be unlawful for any person, including the City of Escondido, to operate any single or combination of powered construction equipment at any construction site, except as outlined in subsections (a) and (b) below:

(a) It shall be unlawful for any person, including the City of Escondido, to operate any single or combination of powered construction equipment at any construction site on Sundays, January 1, the last Monday in May known as "Memorial Day", July 4, the first Monday in September, December 25, and every day appointed by the President, Governor, or the City Council of the City of Escondido. Every January 1, July 4, or December 25 falling upon a Sunday, it shall be unlawful for any person to operate any single or combination of powered construction equipment at any construction site on the following Monday. In addition, it shall be unlawful for any person to operate any single or combination of powered construction equipment at any construction site on Mondays through Saturdays, except between the hours of 7 a.m. and 7 p.m.

(b) No such equipment, or combination of equipment regardless of age or date of acquisition, shall be operated so as to cause noise at a level in excess of seventy-five decibels for more than 8 hours during any twenty-four hour period when measured at a distance of one hundred feet from such equipment, or corresponding sound level at some other distance. These sound levels shall be corrected for time duration in accordance with the following table:

<u>Total Duration in 24 Hours</u>	<u>Decibel Level Allowance</u>	<u>Total Decibel Level</u>
Up to 15 Minutes	+15	90
Up to 30 Minutes	+12	87
Up to 1 Hour	+ 9	84
Up to 2 Hours	+ 6	81
Up to 4 Hours	+ 3	78
Up to 8 Hours	0	75

In the event that lower noise limit standards are established for construction equipment pursuant to State or Federal Law, said lower limits shall be used as a basis for revising and amending the noise level limits specified in subsection (b) above.

Section . CONTAINERS AND CONSTRUCTION MATERIAL. It shall be unlawful for any person to handle or transport or cause to be handled or transported in any public place, any container or any construction material in such a way as to create an unnecessary, excessive, or offensive noise as defined under Section of this ordinance.

Section . SIGNAL DEVICE FOR FOOD TRUCKS. No person shall operate or cause to have operated or used any sound signal device other than sound-amplification equipment attached to a motor vehicle, wagon, or manually propelled cart from which food or any other items are sold which emits a sound signal more frequently than once every ten minutes in any one street block and with a duration of more than ten seconds for any single emmission. The sound level of this sound signal shall not exceed ninety decibels at fifty feet.

Section . MULTIPLE FAMILY DWELLING UNITS. Notwithstanding any other provisions of this ordinance, it shall be unlawful for any person to create, maintain, or cause to be maintained any sound within the interior of any multiple family dwelling unit which causes the median level of 45 decibels to be exceeded in any other dwelling unit for a cumulative period of five minutes in any one hour or 50 decibels for a cumulative period of one minute in any one hour or 55 decibels at no time between the hours of 10 p.m. of one day and 7 a.m. of the following day. The monitoring procedures outlined under Section shall be followed in enforcing this section.

Section . GENERAL NOISE REGULATIONS.

(a) General Prohibitions. In the absence of objective measurement by use of a sound level meter, additionally it shall be unlawful for any person to make, continue, or cause to be made or continued, within the limits of said City, any unnecessary, excessive or offensive noise which causes discomfort or annoyance to any reasonable person of normal sensitiveness residing in the area.

The characteristics and conditions which should be considered in determining whether a violation of the provisions of this section exists should include but not be limited to the following:

- (1) The level of the noise;
- (2) The intensity of the noise;
- (3) Whether the nature of the noise is usual or unusual;
- (4) Whether the origin of the noise is natural or unnatural;

- (5) The level and intensity of the background noise;
- (6) The proximity of the noise to sleeping facilities;
- (7) The nature and zoning of the area within which the noise emanates;
- (8) The density of the inhabitation of the area within which the noise emanates;
- (9) The time of the day or night the noise occurs;
- (10) The duration of the noise;
- (11) Whether the noise is recurrent, intermittent, or constant; and
- (12) Whether the noise is produced by a commercial or noncommercial activity.

(b) Unnecessary, Excessive or Offensive Noises. The following acts, among others, are declared to be unnecessary, excessive and offensive noises in violation of this section, but said enumeration shall not be deemed to be exclusive, namely:

- (1) Horns, Signaling Devices, etc. Violations for unnecessary, excessive or offensive noises associated with the use or operation of horns, signaling devices, etc., on automobiles, motorcycles, or any other vehicle, except as provided in Section , shall be prosecuted under applicable provisions of the California Vehicle Code.
- (2) Radios, Television Sets, Phonographs, and Similar Devices.
 - (i) Uses Restricted. The use, operation, or permitting to be played, used or operated, any radio receiving set, musical instrument, phonograph, television set, or other machine or device for the producing or reproducing of sound in such manner as to disturb the peace, quiet and comfort of neighboring residents or any person of normal sensitiveness residing in the area.
 - (ii) Prima Facie Violations. The operation of any such set, instrument, phonograph, television set, machine or similar device between the hours of 10p.m. and 8 a.m. in such a manner as to be plainly audible at a distance of fifty feet from the building, structure, or vehicle in which it is located, shall be prima facie evidence of a violation of this section.
- (3) Loud Speaking Amplifiers for Advertising. The use, operation, or the permitting to be played, used or operated of any sound production or reproduction device or machine including but not limited to radio receiving sets, phonographs, musical instruments, loudspeakers, and sound amplifiers, for commercial or business advertising purposes in, upon, over, or across any street, alley, sidewalk, park, or public property in such a manner as to violate the provisions of this ordinance is prohibited. This provision shall not be applicable to sound amplifying equipment mounted on any sound truck or vehicle for commercial or non-commercial purposes where the owner or operator complies with the following requirements:
 - (i) The only sounds permitted are music or human speech.

- (ii) Operations are permitted between the hours of 8 a.m. and 9 p.m. or after 9 p.m. during public events and affairs of interest to the general public.
- (iii) Sound amplifying equipment shall not be operated unless the sound truck upon which such equipment is mounted is operated at a speed of at least ten miles per hour except when said truck is stopped or impeded by traffic. Where stopped by traffic the said sound amplifying equipment shall not be operated for longer than one minute at each stop.
- (iv) Sound shall not be issued within one hundred yards of hospitals, schools, churches, or courthouses.
- (v) The human speech and music amplified shall not be profane, lewd, indecent or slanderous.
- (vi) The volume of sound shall be controlled so that said volume is not unreasonably loud, raucous, jarring, disturbing, or a nuisance to persons within the area of audibility and so that the volume of sound shall not exceed a sound level of 65 decibels (on the "A" scale) at a distance of 50 feet from the sound amplifying equipment.
- (vii) No sound amplifying equipment shall be operated unless the axis of the center of any sound reproducing equipment used shall be parallel to the direction of travel of the sound truck; provided, however, that any sound reproducing equipment may be so placed upon said sound truck as to not vary more than 15° either side of the axis of the center of the direction of travel.
- (viii) No sound truck with its amplifying device in operation shall be driven on the same street past the same point more than twice in a period of one hour.

(4) Yelling Shouting, etc. Unnecessary or unreasonably loud or raucous yelling, shouting, hooting, whistling, or singing on the public streets, particularly between the hours of 10 p.m. and 8 a.m. or at any time or place so as to annoy or disturb the quiet, comfort, or repose of neighboring residents or any person of normal sensitiveness within the area for whatever reason, is prohibited.

(5) Hawkers and Peddlers. The shouting or crying out of any peddlers, hawkers, and vendors which disturbs the peace and quiet of a neighborhood or any person of normal sensitiveness is prohibited. This provision shall not be construed to prohibit the selling by outcry of merchandise, food and beverages at sporting events, parades, fairs, celebrations, festivals, circuses, carnivals and other similar special events for public entertainment.

(6) Drums, Other Instruments. The use of any drum or other instrument or device of any kind for the purpose of attracting attention by the creation of noise within the City is prohibited. This provision shall not apply

to any person who is a participant in a school band or legally authorized parade or who has been otherwise duly authorized by the City to engage in such conduct.

(7) Animals and Fowls. The keeping or maintenance, or the permitting to be kept or maintained upon any premises owned, occupied, or controlled by any person of any animal or fowl which by any frequent or long continued noise shall cause annoyance or discomfort to any person of normal sensitiveness in the vicinity; provided, however, that nothing contained herein shall be construed to apply to occasional noises emanating from legally operated dog and cat hospitals, humane societies, pounds, farm and/or agricultural facilities, or areas where keeping of animals or fowls are permitted by the zoning ordinance.

(8) Schools, Courts, Churches, Hospitals. The creation of any noise on any street, sidewalk, or public place adjacent to any school, institution of learning (except recreational areas of schools), church, court or library, while the same are in use; or adjacent to a hospital, rest home, or long-term medical or mental care facility which noise unreasonably interferes with the workings of such institution or which disturbs or unduly annoys patients in the hospital, rest home, or long-term medical or mental care facility, provided conspicuous signs are displayed in such streets, sidewalks, or public places indicating the presence of a school, institution of learning, church, court, library, rest home, or long-term medical or mental care facility, is prohibited.

(9) Steam Whistles. The operation, use or causing to be operated or used any steam whistle attached to any stationary boiler is prohibited except to give notice of the time to start or stop work or as a sound signal of imminent danger.

(10) Engines and Motor Vehicles. Any unnecessary, disturbing or raucous noises caused off streets or highways by racing or accelerating the engine of any motor vehicle while moving or not moving, by the willfull backfiring of any engine and exhaust from the engine tailpipe or muffler, or from the screeching of tires, is prohibited.

Section . EXEMPTIONS.

(a) Emergency Work. The provisions of this chapter shall not apply to any emergency work as defined herein, provided that (1) the Noise Control Officer has been notified in advance, if possible, or as soon as practical after said emergency and (2) any vehicle device, apparatus, or equipment used, related to or connected with emergency work is designed, modified, or equipped to reduce sounds produced to the lowest possible level consistent with effective operation of such vehicle, device, apparatus, or equipment.

(b) Church Bells, etc. The provisions of this chapter shall not apply to the operation or use of any organ, bell, chime, or other similar instrument by any church, synagogue, mosque, school or county-operated facility; provided, however, that such operation or use not create an unnecessary, excessive or offensive noise which causes discomfort or annoyance to any person of normal sensitiveness residing in the area.

(c) Sporting, Entertainment, Public Events. Notwithstanding the provisions of this chapter, those reasonable sounds emanating from a sporting, entertainment, or public event shall not be prohibited.

Section . MANNER OF ENFORCEMENT.

(a) Responsibilities of Enforcement. The Police Department shall be responsible for the enforcement of Sections

provided, however, that whenever noise level measurements are required for enforcement, the Police shall be assisted by the Noise Control Officer and his duly authorized representatives. All other provisions of this section will be enforced by the Noise Control Officer and his duly authorized representatives. Pursuant to Penal Code Section 836.5, the above specified enforcement officers may arrest a person without a warrant when they have reasonable cause to believe that the person has committed a misdemeanor in their presence which is a violation of this chapter. Violations of these regulations will be prosecuted in the same manner as other misdemeanor violations of the Municipal Code; however, nothing in these regulations shall prevent the Police or the Noise Control Officer or his duly authorized representatives from efforts to obtain voluntary compliance by way of warning, notice, or educational means.

Section . VIOLATIONS--MISDEMEANORS. Any person violating any of the provisions of this chapter shall be deemed guilty of a misdemeanor and upon conviction thereof shall be fined in an amount not exceeding five hundred dollars or be imprisoned in the County jail for a period not exceeding six months, or by both such fine and imprisonment. Each day such violation is committed or permitted to continue shall constitute a separate offense and shall be punishable as such.

Section . VIOLATIONS--ADDITIONAL REMEDIES: INJUNCTIONS. As an additional remedy, the operation or maintenance of any device, instrument, vehicle, machinery, or other item in violation of any provision of this chapter for which operation or maintenance causes discomfort or annoyance to persons of normal sensitiveness or which endangers the comfort, repose, health, or peace of residents in the area, shall be deemed and is declared to be a public nuisance and shall be subject to abatement summarily by a restraining order or injunction issued by a court of competent jurisdiction.

Section . FALSE OR MISLEADING STATEMENT. No person shall knowingly make a false or misleading statement or submit a false or misleading document to the Noise Control Officer as to any matter within his jurisdiction.

Section . REPRODUCTIONS OF PERMITS, ETC. No person shall make, reproduce, alter, or cause to be made, reproduced, or altered a permit, certificate, or other document issued by the Noise Control Officer or required by this chapter if the purpose of such reproduction or alteration is to evade or violate the provisions of this chapter.

Section . DISPLAY OF PERMITS. Any permit, certificate, or other notice required herein shall be displayed or maintained on the premises designated thereon.

Section . VARIANCES. Variances from the requirements of this chapter may be granted by the Noise Control Officer to an applicant extending the time period to abate or otherwise correct a noise source which creates or causes sound levels which exceed the allowable sound level standards as specified in this chapter.

The Noise Control Officer shall evaluate all applications for variances from the requirements of this chapter and may grant said variances, subject to such terms and conditions as he may deem reasonable to achieving compliance with the provisions of this chapter. Each variance will specify a date of final compliance with the standards and shall require an approvable correction plan; also, increments of progress if the compliance time is extended past one year from the date the variance becomes effective. In granting variances the Noise Control Officer shall consider the magnitude of nuisance caused by the offensive noise, the uses of property within the area of impingement by the noise, operations carried on under existing nonconforming rights or conditional use permits or zone variances, the time factors related to study, design, financing and construction of remedial work, the economic factors related to age and useful life of the equipment, the general public interest, health and welfare, the feasibility of plans submitted for correction, and the effects on the community if the permit or variance were refused.

Section . APPLICATIONS FOR PERMITS AND VARIANCES. Every applicant for a permit or variance required by this chapter shall file with the Noise Control Officer a written application on a form prescribed by said Officer. The applica-

tion shall state the name and address of the applicant, the nature of the noise source involved, and such other information as the Noise Control Officer may require.

Section . APPLICATION FEES. Every applicant, except any state or local governmental agency or public district, shall pay a fee of \$25.00 for each application for variance.

A request for a duplicate permit or variance shall be made in writing to the Noise Control Officer within 10 days after the destruction, loss, or defacement of a permit or variance. A fee of \$5.00 shall be charged except to any state or local government agency or public district, for issuing a duplicate permit or variance.

Section . EXTENSION FEES. If a permit or variance is to be extended beyond the original use termination on date of permit or variance, the extension fee shall be \$25.00

Section . ACTIONS ON APPLICATIONS. The Noise Control Officer shall act, within 30 days, if possible, on an application for a permit or variance and shall notify the applicant in writing by mail or in person of the action taken, namely, approval, conditional approval, or denial. Notice of the action taken shall be deemed to have been given when the written notification has been deposited in the mail, postpaid, addressed to the address shown on the application, or when personally delivered to the applicant or his representative. Before acting on an application for a variance or permit, the Noise Control Officer may require the applicant to furnish further information or further plans or specifications. Failure of the applicant to provide such further information or further plans or specifications within 30 days shall be grounds for denial of the permit or variance.

In the event of denial of an application for a permit or variance, the Noise Control Officer shall notify the applicant in writing of the reasons therefor. Service of this notification may be made in person or by mail, and such service may be proved by the written acknowledgment of the persons served or affidavit of the person making the service. The Noise Control Officer shall not accept a

further application unless the applicant has complied with the objections specified by the Noise Control Officer as his reasons for denial.

Section . APPLICATIONS DEEMED DENIED. The applicant may at his option deem the permit or variance denied if the Noise Control Officer fails to act on the application within 30 days after filing, or within 15 days after applicant furnishes the further information, plans, and specifications requested by the Noise Control Officer, whichever is later.

Section . PROVISION OF SAMPLING AND TESTING FACILITIES. A person operating under a permit or variance shall provide and maintain such sampling and testing facilities as specified in the permit or variance.

Section . APPEALS. Within 10 days after notice, by the Noise Control Officer, of denial or conditional approval of a variance or a permit, or within 10 days after the effective date of the revocation of a permit or variance by the Noise Control Officer, the affected person may petition the City Council, in writing, for a public hearing. The Hearing Board, after notice and a public hearing after filing the petition, may sustain, reverse or modify the action of the Noise Control Officer; such order may be made subject to specified conditions.

Section . FILING FEE. Request for hearing by the City Council shall be initiated by the filing of a petition in triplicate with the City Clerk and making payment of a \$25.00 fee.

Section . CONTENTS OF PETITION. A petition to review a denial or conditional approval of a permit or variance shall include a copy of the permit or variance application, and a copy of the Noise Control Officer's action setting forth the reasons for the denial or the conditions of the approval, and the reasons for appeal. A petition to review a permit or variance revocation shall include a copy of the permit or variance, the Noise Control Officer's revocation notice, including his reasons for revocation, and the reasons for appeal.

Section . DISMISSAL OF PETITION. The petitioner may dismiss his petition at any time before submission of the case to the City Council, without a hearing or meeting of the City Council. The Clerk of the City Council shall notify all interested persons of such dismissal.

APPENDIX B

Noise Element Requirements

Government Code Section 65302 (g). As amended by Senate Bill 860 (Beilenson, 1975) which became effective January 1, 1976, now reads as follows:

A noise element which shall recognize guidelines adopted by the Office of Noise Control pursuant to Section 39850.1 of the Health and Safety Code, and which quantifies the community noise environment in terms of noise exposure contours for both near and long-term levels of growth and traffic activity. Such noise exposure information shall become a guideline for use in development of the land use element to achieve noise compatible land use and also to provide baseline levels and noise source identification for local noise ordinance enforcement.

The sources of environmental noise considered in this analysis shall include, but are not limited to, the following:

- (1) Highways and freeways.
- (2) Primary arterials and major local streets.
- (3) Passenger and freight on-line railroad operations and ground rapid transit systems.
- (4) Commercial, general aviation, heliport, helistop, and military airport operations, aircraft overflights, jet engine test stands, and all other ground facilities and maintenance functions related to airport operation.
- (5) Local industrial plants, including, but not limited to, railroad classification yards.
- (6) Other ground stationary noise sources identified by local agencies as contributing to the community noise environment.

The noise exposure information shall be presented in terms of noise contours expressed in community noise equivalent level (CNEL) or day-night average level (L_{dn}). CNEL means the average equivalent A-weighted sound level during a 24-hour day, obtained after addition of five decibels to sound levels in the evening from 7 p.m. to 10 p.m. and after addition of 10 decibels to sound levels in the night before 7 a.m. and after 10 p.m. L_{dn} means the average equivalent A-weighted sound level during a 24-hour day, obtained after addition of 10 decibels to sound levels in the night before 7 a.m. and after 10 p.m.

The contours shall be shown in minimum increments of 5db and shall continue down to 60db. For areas deemed noise sensitive, including, but not limited to, areas containing schools, hospitals, rest homes, long-term medical or mental care facilities, or any other land use areas deemed noise sensitive by the local jurisdiction, the noise exposures shall be determined by monitoring.

A part of the noise element shall also include the preparation of a community noise exposure inventory, current and projected, which identifies the number of persons exposed to various levels of noise throughout the community.

The noise element shall also recommend mitigating measures and possible solution to existing and foreseeable noise problems.

The state, local, or private agency responsible for the construction, maintenance, or operation of those transportation industrial or other commercial facilities specified in paragraph 2 of this subdivision shall provide to the local agency producing the general plan, specific data relating to current and projected levels of activity and a detailed methodology for the development of noise contours given this supplied data, or they shall provide noise contours as specified in the foregoing statements.

It shall be the responsibility of the local agency preparing the general plan to specify the manner in which the noise element will be integrated into the city or county's zoning plan and tied to the land use and circulation elements and to the local noise ordinance. The noise element, once adopted, shall also become the guideline for determining compliance with the State's Noise Insulation Standards, as contained in Section 1092 of Title 25 of the California Administrative Code.

APPENDIX C

NOISE ELEMENT

THE EFFECTS OF NOISE ON PEOPLE (1)

Sound, so vital a part of our existence, is growing to such disagreeable proportions within our environment that today it is a very real threat to our health.

So noisy, in fact, is America's urban environment that people living in congested sections of large cities may be hearing far less than they realize; many are developing severe hearing loss. Suburbanites will not fare much better. As noise levels in their communities continue to increase, they may be destined for the same fate.

The problem is not limited to the out-of-doors. Noise in our homes is beginning to reach harmful levels. We are using more tools and appliances and, as their power has increased, so has the noise. The combination of hi-fi equipment and the rock music which dominated the past decade, alone has probably affected the hearing of a whole generation of listeners.

If these statements seem scary, they should. They are not exaggerations. Noise pollution is a growing menace, not just to boilermakers and jackhammer operators, but to all of us. The noise level we experience daily has increased so gradually that we fail to recognize its danger. But noise is a danger. It can result in a hearing loss that not only can be a handicap, but what is worse, a hearing loss that cannot be restored.

Unless controlled, noise pollution will exact an increasingly heavy toll on society. Already an estimated 16 million people in the United States suffer from some degree of hearing loss directly caused by noise. Such hearing loss, in fact, is a major cause of industrial injury. Compensation to its victims annually runs into millions of dollars.

(1) U.S. Environmental Protection Agency reports: Noise Pollution, August 1973, and Impact Characterization of Noise Including Implications of Identifying and Achieving Levels of Cumulative Noise Exposure, July 1973.

Although definitive research has yet to be done, some recent studies suggest that existing noise levels may be a cause in the rising rates of heart disease, ulcers and mental illness and may even adversely affect the unborn child.

The danger from noise is very real.

Damage to Hearing

Noise of 120 decibels and higher will cause ear pain. Pain occurs as the ear unsuccessfully attempts to protect itself through a mechanism physicians call "the acoustic reflex." When sound enters the ear, the waves pass through the ear canal to the eardrum which vibrates. The eardrum conducts these vibrations to three tiny bones called ossicles - the three tiniest bones of the body. It is here that the acoustic reflex occurs. The ossicles change the loudness of sound before it enters the inner ear. Normal action of the ossicles may amplify soft sounds or dampen loud sounds as their tiny muscles contract to decrease the pressure of the sound waves.

The acoustic reflex protects the inner ear from extra loud sounds by reducing them, just as the eye protects itself from extra bright light by contracting the pupil. The ear is not completely successful in this task. The reason is twofold: First, the reflex occurs on command from the brain a few hundredths of a second after the loud sound is first sensed. Thus, at least some of the sound at full loudness gets through to the delicate inner ear before the reflex goes into operation. Second, muscles cannot contract indefinitely so their sound-dampening capacity is limited. Thus, if the sound is sustained, the inner ear may still be bombarded with excessive sound pressure even after the reflex has had a chance to work. In the case of impulse sounds such as a gunshot, the reflex is virtually useless as a defense.

What happens when loud sounds enter the inner ear? The ossicles transmit the vibrations to a fluid contained in a tiny, snail-shaped structure called the cochlea. Within the cochlea are microscopic hair cells that move back and forth in response to the sound waves just as seaweed on the ocean floor undulates in response to wave action in the ocean. It is the energy impulses created by the movement of these crucial hair cells that go to the brain where they are interpreted as sound. But just as the seaweed can be torn and ripped by violent wave action in the ocean, so too, can hair cells be damaged by too intense sound waves.

When intense sound waves occur only briefly, the damage may be temporary. But if loud noises are frequent or sustained, the damage may be permanent, and such noise-induced hearing loss cannot be restored either through surgical procedures or hearing aids. Permanent loss, however, occurs only in certain frequencies because different hair cells respond differently to various frequencies. Unfortunately, the hair cells that seem to be the most susceptible to damage are those that respond to the high frequency.

This selective damage can severely impair the understanding of human speech. It may be even more insidious than a broad-range hearing loss because it may not be readily recognized. Recent studies of young school children, thought to be "slow learners" revealed that at least some of them simply could not hear everything that was being said in the classroom. Once adjustments were made, these children were able to match the scholastic performance of their classmates. Similar undetected hearing difficulties may be the cause of unexplained performance impairment among adults.

Obviously, noise may accelerate the progressive loss of hearing we all suffer as we grow older. To learn just how much, scientists visited an isolated area in Africa to examine the hearing acuity of a large number of elderly tribesmen and their youthful counterparts. Their findings: men in their 70s and 80s had hearing sensitivity nearly equal to that of the young boys and equivalent to that of Americans 30 to 40 years their junior!

Undetected hearing loss is a clear danger to each of us. We are dependent on a wide variety of audible signals, many of them for our safety. Consider the danger to a driver or pedestrian who cannot hear the siren of a fire engine, or the construction worker who does not hear the warning whistle before an explosive charge is detonated.

A Task Group appointed by the Environmental Protection Agency (EPA) to carry out part of its responsibility under the Noise Control Act of 1972 has reviewed the research on levels of noise that cause hearing loss. Table 1 summarizes that research. It shows the relationship between daily noise exposure level and noise

induced hearing loss for the most sensitive 10 percent of the population. For example, the lowest 4000 hertz (Hz) frequency sound that can be heard by a person who has been exposed to an 85 decibel average sound level for 40 years is 19 decibels louder than the lowest level he was able to hear at the beginning of the 40 years prior to noise exposure. His hearing loss (or threshold shift) has been 19 decibels at that frequency. The Task Group concludes:

"that a day-night average sound level less than 83 db(A) is required, to assure that at least 90 percent of the general population have no measurable loss of hearing ability over the 500 to 4,000 Hz range of frequency. Such cumulative effects of environmental noise would show up only after exposures exceeding 10 years. This means that hearing damage data on which to base criteria of acceptable noise exposure, or to modify the initial choice of criteria, accrue very slowly. Prudence demands a conservative approach to setting criteria in such a situation. Moreover, the 83 dB limit was derived under certain assumptions regarding life style and exposure that might lead to over or underestimation of individual exposures. Therefore, in view of the latter uncertainty, it is judged reasonable to recommend an L_{dn} of 80 dB as the maximum permissible yearly outdoor average sound level, to prevent adverse health effects on people's hearing."

TABLE 1

Maximum noise induced permanent threshold shift (hearing loss) in decibels, at various audiometric frequencies, for the most sensitive 10 percent of the population, assuming a 40-year exposure for 8 hours per day, as a function of the A-weighted average sound level of broad-band noise.*

A-weighted Average Sound Level in dB**

Audiometric Frequencies Hertz (Hz)	<u>75</u>	<u>80</u>	<u>85</u>	<u>90</u>
Average shift at 500, 1,000 and 2,000 Hz	1	1	4	7
Average shift at 500, 1,000 2,000 and 4,000 Hz	2	4	7	12
Shift at 4,000 Hz	6	11	19	28

* Example: Of a large number of people exposed for 8 hours per day over a 40 year working lifetime to broad band noise with A-weighted average sound level of 85 dB, the most sensitive 10 percent of these people will exhibit, on the average, permanent threshold shifts as follows: at a frequency of 4,000 Hz, the shift will be 19 dB; the average of the shifts at the frequencies 500, 1,000, 2,000, and 4,000 Hz will be 7 dB; the average of the shifts at 500, 1,000, and 2,000 Hz will be 4 dB.

**Add 5 dB to average sound level for intermittent noise such as that produced by aircraft operations.

Work done by other groups at EPA has also confirmed the establishment of this level. (2)

Interference with Conversation

Another detrimental effect of noise is to drown out sounds we want to hear, such as speech. When background noise exceeds 50-60 decibels conversation is impaired.

The EPA Task Group mentioned above has also evaluated the effects of background noise on conversation. They have concluded:

"that the outdoor day-night average sound level should not exceed 63 dB if people are to enjoy their normal domestic activities indoors or to converse without difficulty outdoors at a two meter distance" (a common face-to-face distance for conversation).

Sleep Disturbance

Noise can interfere with sleep by either awakening a person or causing a shift from a deep sleep level to a shallower level. Brief sounds of sufficient intensity and fluctuating noise levels above 35-45 decibels have been shown to alter the sleep pattern to lighter sleep and hence poorer sleep. Research indicates that when people are exposed to a great deal of noise they will complain of sleep loss and suffer a reduction of their feeling of well being. Regular interruptions of sleep by noise may prove a health hazard both physically and mentally.

The EPA Task Group in considering the effects of noise on sleep has stated:

"The maximum permissible outdoor level of $L_{dn} = 60$ dB, proposed (below) in order to limit people's annoyance due to noise, would provide average sound levels from exterior noise sources below 35 dB at night in an average bedroom with closed windows. The levels in a bedroom with open windows could, of course, be higher but it is reasonable to expect people who open their windows at night to be able to accommodate to slightly higher levels."

(2) Public Health and Welfare Criteria for Noise, July 27, 1973, #550-0-73-02; and Effects of Noise on People, December 3, 1971, #NTID 300.7.

"Experience has shown that, for typical traffic, airport and city noises, when the day/night difference in the equivalent noise level is 10 dB or more, the daytime exposure is the main concern with respect to potential speech interference and annoyance. In these situations, a maximum permissible outdoor L_{dn} of 60 dB, will generally cause negligible speech interference or annoyance during daytime, and will most likely cause no adverse effects on night-time sleep in normal people accustomed to the environment, even with windows partially open."

Stress Effects of Noise

At noise levels of 85 decibels or more human stress reactions can be expected. When the brain perceives noise, it reacts. Most of us automatically interpret unexpected noise as danger, a signal to prepare to fight or run. It may be a subconscious reaction, but it is clearly indicated by the physical changes that take place in response to noise. Even a sound of moderate volume and short duration such as a heavy truck passing on the other side of the street (rated about 80 decibels), produces a remarkable number of these physical changes. Blood vessels in the brain dilate while blood vessels in other parts of the body constrict. Blood pressure rises and the heart rhythm changes. The pupils of the eyes dilate. The blood cholesterol level rises. Various endocrine glands pour additional hormones into the blood. Even the stomach changes its rate of acid secretion. While most of these reactions are only temporary, the modern environment presents such ever-changing noise levels that some of these "temporary" effects become chronic.

We may not be immediately aware of these changes since they are functions of the so-called involuntary or automatic nervous system. Yet this dramatic reaction to noise occurs in our bodies many times each day as we encounter the clamor of modern Twentieth-century living. Traffic, machinery, household appliances, lawnmowers, telephones, typewriters, barking dogs and shouting people all contribute. The effect on each of us can be profound.

Ulcers, indigestion, "heartburn", gastro-intestinal malfunctions, heart disease, all are connected to stress in general and since noise is interpreted by the body as a stress, noise may also be a contributing factor in the rate of occurrence of these disease conditions.

Psychological Effects

Stress also is a factor in mental illness, which may be defined as a reaction to a person's inability to cope with the many tensions of daily living. Mental illness develops when individuals are literally overwhelmed by the onslaught of stress and mentally retreat to escape. While environmental noise alone probably does not produce mental illness, the continual bombardment of noise on an already depressed person cannot be helpful. Certainly it interferes with sleep, producing irritability and other tensions. Definitive research has not been done in this area, but one 1969 study in England provides strong supporting evidence. Comparative studies of persons living adjacent to London's Heathrow Airport with others living in a quieter environment revealed that among those living in the noisy environment there was a significantly higher rate of admission to mental hospitals. Another recent medical discovery is the effect of noise on unborn babies. Previously they were thought to be insulated from the noise stress of the outside world, but now physicians believe that external noises can and do trigger changes in fetuses.

Even when we do not suffer from these extreme and tragic consequences, we are victims of noise. It is well known that noise causes headaches in a variety of ways. Because the brain interprets it as a danger signal, noise interrupts thought and mental concentration. This, in turn, not only lowers the working efficiency of people doing exacting or predominantly mental work, but the constant distraction of noise makes them more nervous, irritable and generally unsettled. It affects others in a similar manner. One study of steelworkers indicates that those working in a noisy environment are more aggressive, distrustful and irritable than workers in a quieter environment.

Noise Annoyance

An effect of noise which may include some of those discussed above is annoyance. It is a general term for describing the adverse response of people to noise. The EPA Task Group reviewed several studies on the annoyance of people caused by different noise levels, both for airports and other community noise sources. These studies showed an almost identical relationship between noise levels and percentage of people annoyed.

With the wide disparity between the percent annoyed and the percent complaining, it can be seen that the number of complaints is not an adequate measure of the effects of noise on people. The EPA Task Group recommends a maximum permissible average day-night sound level of 55 to 60 dB as the long range goal to protect the public's health and welfare.

The Task Group states:

"An outdoor L_{dn} of approximately 60 dB or less is required in order that no more than 23% of the population exposed to noise would be individually highly annoyed. (The same average sound level would guarantee that, on the average, 95% effective speech conversation at two meters distance outdoors would be possible at all times, and normal domestic speech activities are possible indoors, with open windows.) It therefore appears reasonable to propose an L_{dn} of 55 to 60 dB as the long range goal for maximum permissible average sound level with respect to health and welfare. (Note that this level is not considered optimum, merely the upper limit of permissibility. No endorsement is intended of degradation of existing areas having a lower noise level.)"

NOISE IMPACT ON HUMAN ACTIVITIES

HUMAN ACTIVITY	IMPACT ESTIMATE FOR Ldn					
	45	55	65	75	85	95
Intensive Conversation		■■■	■■■			
Casual Conversation					■■■	■■■
Telephone Use			■■■■■	■■■■■	■■■■■	■■■■■
Sleeping	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■
Eating			■■■■■	■■■■■	■■■■■	■■■■■
Reading			■■■■■	■■■■■	■■■■■	■■■■■
Meditation			■■■■■	■■■■■	■■■■■	■■■■■
Writing			■■■■■	■■■■■	■■■■■	■■■■■
Studying			■■■■■	■■■■■	■■■■■	■■■■■
Seminar, Group Discussion		■■■■■	■■■■■	■■■■■	■■■■■	■■■■■
Classroom, Lecture		■■■■■	■■■■■	■■■■■	■■■■■	■■■■■
Individual Creative Activity			■■■■■	■■■■■	■■■■■	■■■■■
Live Theater	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■
Watching Films		■■■■■	■■■■■	■■■■■	■■■■■	■■■■■
Watching Television		■■■■■	■■■■■	■■■■■	■■■■■	■■■■■
Listening to Music	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■
Ceremony, Tradition		■■■■■	■■■■■	■■■■■	■■■■■	■■■■■
Public Events, Assemblies			■■■■■	■■■■■	■■■■■	■■■■■
Spectator Sports ¹			■■■■■	■■■■■	■■■■■	■■■■■
Public Mass Recreation ¹			■■■■■	■■■■■	■■■■■	■■■■■
Physical Recreation ¹	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■
Outdoor Activities ¹	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■
Urban Outdoor Activities ¹	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■
Extended Child Care		■■■■■	■■■■■	■■■■■	■■■■■	■■■■■
Driving ¹				■■■■■	■■■■■	■■■■■
Shopping			■■■■■	■■■■■	■■■■■	■■■■■
Technical Manual Work	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■
Skilled Manual Work			■■■■■	■■■■■	■■■■■	■■■■■
Manual Work			■■■■■	■■■■■	■■■■■	■■■■■
Equipment Operation ²			■■■■■	■■■■■	■■■■■	■■■■■
Repetitive Work			■■■■■	■■■■■	■■■■■	■■■■■
Noise-Sensitive Equipment ²	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■

LOW IMPACT: Activity can be performed with little or no interruption from aircraft noise, though noise may be noticeable above background levels.

MODERATE IMPACT: Activity can be performed but with some interference from aircraft noise due to level or frequency of interruptions.

SERIOUS IMPACT: Activity can be performed but only with difficulty in the aircraft noise environment due to level or frequency of interruptions.

CRITICAL IMPACT: Activity cannot be performed acceptably in the aircraft noise environment.

SOURCE: U. S. Department of Housing and Urban Development, Aircraft Noise Impact; Planning Guidelines for Local Agencies, by Wilsey & Ham and Bolt, Beranek and Newman, 1972.

1. No allowance for structural insulation.
2. Depends on characteristics of particular equipment.

APPENDIX D

NOISE MITIGATION

If noise exposures are too high to be compatible with land use, there are two basic methods for mitigation excessive sound levels.

1. Baffles or barriers to reduce site exposure to noise, or
2. Insolation of building by insulation, sealing, or other means to reduce indoor exposure levels.

These methods may be used alone or together depending on exposure conditions and desired level of attenuation. By these methods, compatibility is created. A third more desirable method, is to locate land uses in noise-compatible areas when that choice is available, thus eliminating the cost of applying mitigating measures.

The following discussion of methods for mitigating noise is taken from The Audible Landscape: A Manual for Highway Noise and Land Use (Nov. 1974), and Tree Covered Land Forms for Noise Control (July 1974).

BARRIERS

A noise barrier is an obstacle placed between a noise source and a receiver which interrupts the path of the noise. They can be made out of many different substances:

- A. Sloping mounds of earth, called berms,
- B. Walls and fences made of various materials including concrete, wood metal, plastic, and stucco,
- C. Regions of dense plantings of shrubs and trees,
- D. Combinations of the above techniques.

The choice of a particular alternative depends upon considerations of space, cost, safety, and aesthetics, as well as the desired level of sound reduction. The effectiveness of the barrier is dependent on the mass and height of the barrier, and its distance from the noise source and the receiver. To be effective a barrier must block the "line of sight" between the highest point of a noise source, such as a truck's exhaust stack, and the highest part of the receiver.

To be most effective, a barrier must be long and continuous to prevent sounds from passing around the ends. It must also be solid, with few, if any, holes, cracks or openings. Aesthetic design is also important. A barrier constructed without regard for aesthetic considerations could easily be an eyesore. A well designed berm or fence can aesthetically improve an area from viewpoints of both the motorist and the users of nearby land.

Earth Berms - An earth berm, a long mound of earth running parallel to the highway, is one of the most frequently used barriers.

Berms can range from five to fifty feet in height. The higher the berm, the more land is required for its construction. Because of the amount of land required, a berm is not always the most practical solution to highway noise. Different techniques must be applied in urban as distinct from rural settings.

A berm can provide noise attenuation of up to 15 dBA if it is several feet higher than the "line of sight" between the noise source and the receiver. This is comparable to the noise reduction of various walls and fences which are used as barriers. However, earth berms possess an added advantage; instead of reflecting noise from one side of the highway to another, as walls do, they deflect sounds upwards.

Walls and Fences as Barriers - In addition to the more usual function of keeping people, animals, and vehicles from entering the highway right-of-way at undesired locations, a properly designed fence or wall can also provide visual and acoustical separation between highway noise sources and adjacent land areas. This method can reduce noise as much as 15 dBA.

The vertical construction and minimal width of walls and fences makes installation possible when space is severely limited. This is especially important when land costs are high, and where buildings are already adjacent to the highway. The number of design variations for fence and wall barriers is virtually unlimited.

Acoustically, any solid continuous structure will suffice, provided that it is high enough, and provided that the barrier is of adequate mass and density.

Plantings - Plants absorb and scatter sound waves. However, the effectiveness of trees, shrubs, and other plantings as noise reducers is the subject of some debate. Some conclusions can, however, be drawn:

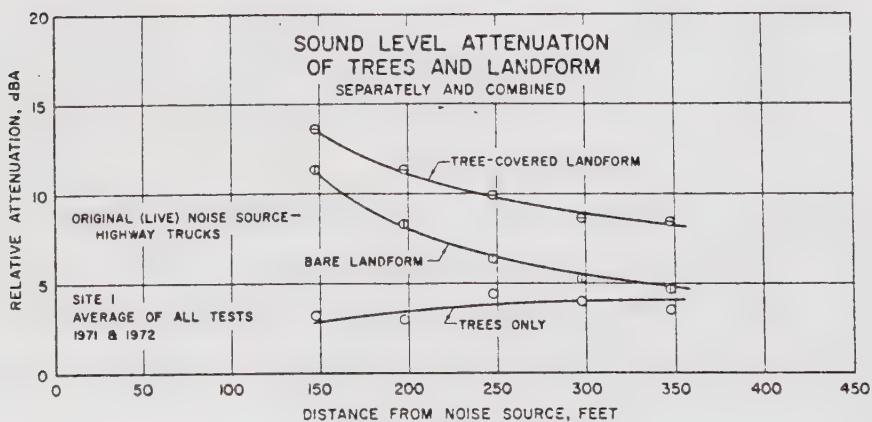
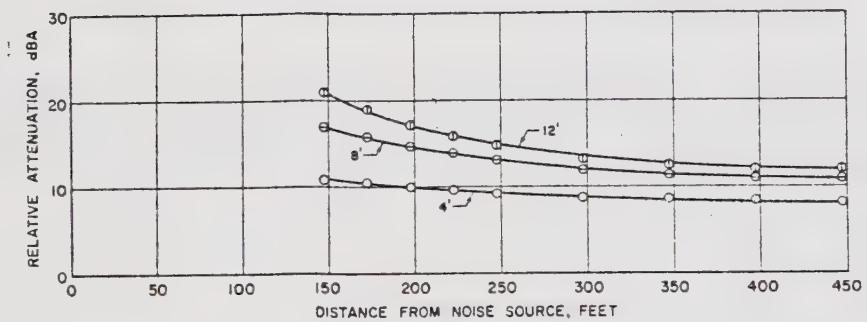
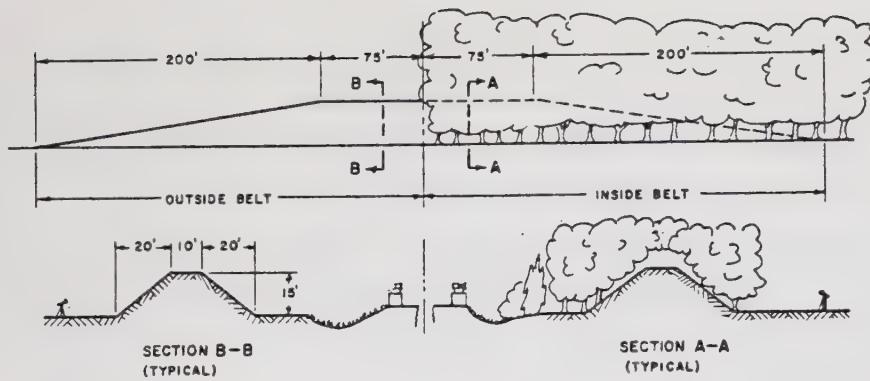
- A. Plantings in a buffer strip, high, dense, and thick enough to be visually opaque, will provide more attenuation than that provided by the mere distance which the buffer strip represents. A reduction of 3 - 5 dBA per 100 feet can be expected. Shrubs or other ground cover are necessary in this respect to provide the required density near the ground.
- B. The principal effect of plantings is psychological. By removing noise source from view, plantings can reduce human annoyance to noise. The fact that people cannot see the highway can reduce their awareness of it, even though the noise remains.
- C. Time must be allowed for trees and shrubs to attain their desired height.
- D. Because they lose their leaves, deciduous trees do not provide year-round noise protection.

In general, plantings by themselves do not provide much sound attenuation. It is more effective, therefore, to use plantings in conjunction with other noise reduction techniques and for aesthetic enhancement.

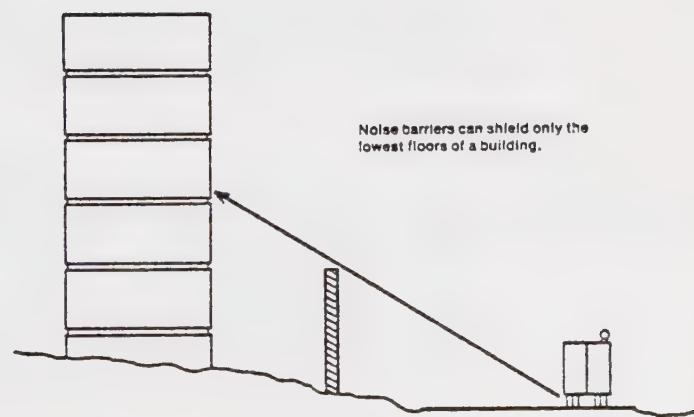
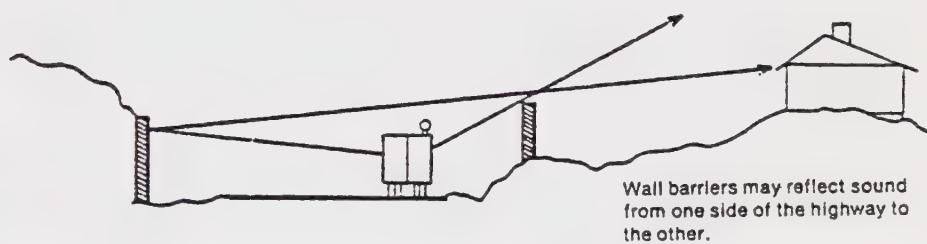
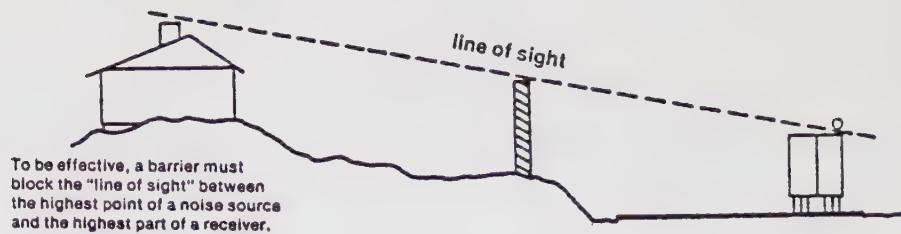
Acoustical Construction

Noise can be intercepted as it passes through the walls, floors, windows, ceilings, and doors of a building. Examples of noise reducing materials and construction techniques are described in the pages that follow.

To compare the insulation performance of alternative constructions, the SOUND TRANSMISSION CLASS (STC) is used as a measure of a material's ability to reduce sound. Sound Transmission Class is equal to the number of decibels a sound is reduced as it passes through a material. Thus, a high STC rating indicates a good insulating material. It takes into account the influence of different frequencies on sound transmission, but essentially it is the difference between the sound levels on the side of the partition where the noise originates and the side where it is received. For example, if the external noise level is 85 dB and the desired internal level is 45 dB, a partition of 40 STC is required. The Sound Transmission Class rating is the official rating endorsed by the American Society of Testing and Measurement. It can be used as a guide in determining what type of construction is needed to reduce noise.



RELATIVE ATTENUATION RESULTING FROM LAND FORM AND TREES, SEPARATELY AND COMBINED
 SOURCE: Cook & Haverbeke. Tree-covered land forms for noise control, Research Bulletin #263. U.S. Forest Service. July, 1974.



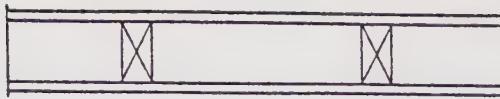
SOME PROBLEMS AND PROPERTIES RELATED TO THE USE NOISE ATTENUATION BARRIERS

A. Walls - Walls provide building occupants with the most protection from exterior noise. Different wall materials and designs vary greatly in their sound insulating properties.

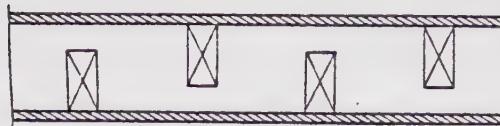
1. Increase the mass and stiffness of the wall. In general, the denser the wall material, the more it will reduce noise. Thus, concrete walls are better insulators than wood walls of equal thickness. Increasing the thickness of a wall is another way to increase mass and improve sound insulation. Doubling the thickness of a partition can result in as much as a 6 dB reduction in sound. However, the costs of construction tend to limit the feasibility of large increases in wall mass.

The relative stiffness of the wall material can influence its sound attenuation value. Care must be taken to avoid wall constructions that can vibrate at audible frequencies and transmit exterior sounds.

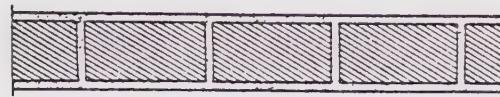
2. Use cavity partitions. A cavity wall is composed of two or more layers separated by an airspace. The airspace makes a more effective sound insulator than a single wall of equal weight, leading to cost savings.
3. Increase the width of the airspace. A three inch airspace provides significant noise reduction, but increasing the spacing to six inches can reduce noise levels by an additional 5 dBA. Extremely wide airspaces are difficult to design.
4. Increase the spacing between studs. In a single stud wall, 24 inch stud spacing gives a 2-5 dB increase in STC over the common 16 inch spacing.
5. Use staggered studs. Sound transmission can be reduced by attaching each stud to only one panel and alternating between the two panels.
6. Use resilient materials to hold the studs and panels together. Nails severely reduce the wall's ability to reduce noise. Resilient layers such as fiber board and glass fiber board, resilient clips, and semi-resilient attachments are relatively inexpensive, simple to insert, and can raise the STC rating from 2-5 dB.
7. Add acoustical blankets. Also known as isolation blankets, these can increase sound attenuation when placed in the airspace. Made from sound absorbing materials such as mineral or rock wool, fiberglass, hair felt or wood fibers, these can attenuate noise as much as 10 dB. They are mainly effective in relatively lightweight construction.
8. Seal cracks and edges. If the sound insulation of a high performance wall is ever to be realized, the wall must be well sealed at the perimeter. Small holes and cracks can be devastating to the insulation of a wall. A one-inch square hole or a 1/16 inch crack 16 inches long will reduce a 50 STC wall to 40.



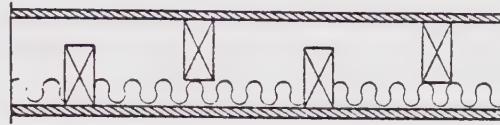
Common Stud Wall
STC = 35
cost = .87/ft²



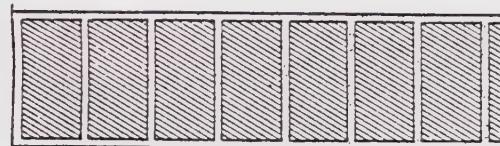
Staggered Stud Wall
STC = 39
cost = 1.12/ft²



4" Brick Wall
STC = 40
cost = 2.00/ft²



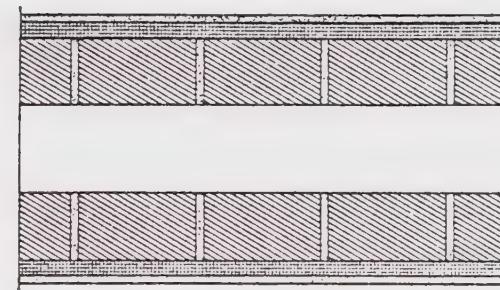
**Staggered Stud Wall
with Absorbent Blankét**
STC = 43
cost = 1.25/ft²



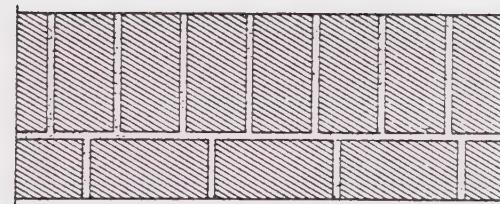
9" Brick Wall
STC = 52
cost = 2.52/ft²



7" Concrete Wall
STC = 52
cost = 1.97/ft²



Double Brick Wall
STC = 53
cost = 2.80/ft²



12" Brick Wall
STC = 54
cost = 4.25/ft²

SOUND TRANSMISSION CLASS RATINGS FOR VARIOUS WALL ASSEMBLIES

B. Windows - Sound enters a building through its acoustically weakest points, windows are one of the weakest parts of a wall. An open or weak window will severely negate the effect of a very strong wall. Whenever windows are going to be a part of the building design, they should be given acoustical consideration.

The following is a discussion of techniques that can be used to reduce noise in a building by means of its windows. These techniques range from a blocking of the principal paths of noise entry to a blocking of the most indirect paths.

1. Close windows. The first step in reducing unwanted sound is to close and seal the windows. The greatest amount of sound insulation can be achieved if windows are permanently sealed. However, openable acoustical windows have been developed which are fairly effective in reducing sound. Whether or not the sealing is permanent, keeping windows closed necessitates the installation of an airconditioning system.
2. Reduce window size. The smaller the windows, the greater the transmission loss of the total partition of which the window is a part. Reducing the window size is a technique that is used because; a) it precludes the cost of expensive acoustical windows, and b) it saves money by cutting down the use of glass. The problems with this technique are a) it is not very effective in reducing noise; e.g., reducing the proportion of window to wall size from 50% to 20% reduces noise by only 3 decibels; and b) many building codes require a minimum window to wall size ratio.
3. Increase glass thickness. If ordinary windows are insufficient in reducing noise impacts in spite of sealing techniques, then thicker glass can be installed. In addition, this glass can be laminated with a tough transparent plastic which is both noise and shatter resistant. Glass reduces noise by the mass principle; that is, the thicker the glass, the more noise resistant it will be. A $\frac{1}{2}$ -inch thick glass has a maximum STC rating of 35 dB compared to a 25 dB rating for ordinary $\frac{3}{16}$ -inch glass.

However, glass thicknesses are only practical up to a certain point, when STC increases become too insignificant to justify the cost. For example, a $\frac{1}{2}$ -inch thick glass can have an STC of 35; increasing the thickness to $\frac{3}{4}$ -inch only raises the STC to 37. However, a double glass acoustical window consisting of two $\frac{3}{16}$ -inch thick panes separated by an airspace will have an STC of 51 and can cost less than either solid window.

In addition to thickness, proper sealing is crucial to the success of the window. To prevent sound leaks, single windows can be mounted in resilient material such as rubber, cork, or felt.

4. Install Double-Glazed Windows. Double-glazed windows are paired panes separated by an airspace or hung in a special frame. Generally, the performance of the double-glazed window may be increased with:

- a) increased airspace width
- b) increased glass thickness
- c) proper use of sealings
- d) slightly dissimilar thicknesses of the panes
- e) slightly non-parallel panes

In general the airspace between the panes should not be less than 2-4 inches if an STC above 40 is desired. If this is not possible, a heavy single-glazed window can be used. The use of slightly non-parallel panes is a technique employed when extremely high sound insulation is required, such as in control rooms of television studios.

The thickness of double-glazed panes may vary from 1/8 to 1/4 inch or more per pane. Although thickness is important, the factors which most determine the noise resistance of the window is the use of sealant and the width of the airspace. As in the case of all windows, proper sealing is extremely important. To achieve an STC above 43, double-glazed windows should be sealed permanently. If the windows must be openable, there are available special frames and sealers for openable windows which allow a maximum STC of 43.

Permanently sealed double-glazed windows often require an air pressure control system to maintain a constant air pressure and minimal moisture in the airspace. Without this system, the panes may deflect, and, in extremely severe cases, pop out of the frames.

To further insure isolation of noise between double-glazed panes, the panes could be of different thicknesses, different weights, and slightly non-parallel to each other. This prevents acoustical coupling and resonance of sound waves.

C. Doors - Acoustically, doors are even weaker than windows, and more difficult to treat. Any door will reduce the insulation value of the surrounding wall. The common, hollow core door has an STC rating of 17 dB. Taking up about 20% of the wall, this door will reduce a 48 STC wall to 24 STC. To strengthen a door against noise, the hollow core door can be replaced by a heavier solid core door that is well sealed and is relatively inexpensive. A solid core door with vinyl seal around the edges and carpeting on the floor will reduce the same 48 STC wall to only 33 dB. An increased sound insulation value can be achieved if gasketed stops or drop bar threshold closers are installed at the bottom edge of the door.

The alternative solution to doors is to eliminate them whenever possible from the severely impacted walls and place them in more shielded walls.

APPENDIX E

NOISE LIMITS FOR NEW MOTOR VEHICLES
STATE OF CALIFORNIA

TABLE 1

S27200. (a) No person shall sell or offer for sale a new motor vehicle which produces a maximum noise exceeding the following noise limit at a distance of 50 feet from the centerline of travel under test procedures established by the department:

(1)	Any motorcycle manufactured before 1970	92 dbA
(2)	Any motorcycle, other than a motor-driven cycle, manufactured after 1969, and before 1973	88 dbA
(3)	Any motorcycle, other than a motor-driven cycle, manufactured after 1972, and before 1975	86 dbA
(4)	Any motorcycle, other than a motor-driven cycle, manufactured after 1974, and before 1978	80 dbA
(5)	Any motorcycle, other than a motor-driven cycle, manufactured after 1977, and before 1988	75 dbA
(6)	Any motorcycle, other than a motor-driven cycle, manufactured after 1987	70 dbA
(7)	Any snowmobile manufactured on or after January 1, 1973, and before January 1, 1975	82 dbA
(8)	Any motor vehicle with a gross vehicle weight rating of 6,000 pounds or more manufactured after 1967, and before 1973	88 dbA
(9)	Any motor vehicle with a gross vehicle weight rating of 6,000 pounds or more manufactured after 1972, and before 1975	86 dbA
(10)	Any motor vehicle with a gross vehicle weight rating of 6,000 pounds or more manufactured after 1974, and before 1978	83 dbA
(11)	Any motor vehicle with a gross vehicle weight rating of 6,000 pounds or more manufactured after 1977, and before 1988	80 dbA
(12)	Any motor vehicle with a gross vehicle weight rating of 6,000 pounds or more manufactured after 1987	70 dbA
(13)	Any other motor vehicle manufactured after 1967, and before 1973	86 dbA
(14)	Any other motor vehicle manufactured after 1972, and before 1975	84 dbA
(15)	Any other motor vehicle manufactured after 1974, and before 1978	80 dbA

SOURCE: Section 27160, Motor Vehicle Code, as amended by AB 108, 1975

TABLE 2
 NOISE LIMITS FOR ON-HIGHWAY MOTOR VEHICLES
 STATE OF CALIFORNIA

	On Streets with a Grade of 1% or higher	On Streets with a Grade not exceeding 1%	
	<u>Speed Limit of 35 mph or less</u>	<u>Speed Limit of more than 35 mph</u>	<u>Speed Limit of 35 mph or less</u>
(1) Any motor vehicle with a manufacturer's gross vehicle weight rating of 6,000 pounds or more and any combination of vehicles towed by such motor vehicle:			
(a) Before January 1, 1973	88 dB(A)	90 dB (A)	—
(b) On and after January 1, 1973	86 dB(A)	90 dB (A)	82 dB(A)
(2) Any motorcycle other than a motor-driven cycle	82 dB(A)	86 dB (A)	77 dB(A)
(3) Any other motor vehicle and any combination of vehicles towed by such motor vehicle	76 dB(A)	82 dB (A)	74 dB(A)

SOURCE: Section 23130, 23130.5, Motor Vehicle Code

TABLE 3

NOISE LIMITS FOR NEW OFF-HIGHWAY MOTOR VEHICLES
STATE OF CALIFORNIA

(1) Any such vehicle manufactured on or after January 1, 1972 and before January 1, 1973	92 dBA
(2) Any such vehicle manufactured on or after January 1, 1973, and before January 1, 1975	88 dBA
(3) Any such vehicle manufactured on or after January 1, 1975	86 dBA

SOURCE: Section 38280, Motor Vehicle Code

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